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RURAL ANNUAL

AND

HORTICULTURAL DIRECTORY:

ROCHESTER, N. Y.
JAMES VICK, JR.
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THE

RURAL ANNUAL

AND

HORTICULTURAL DIRECTORY:

CONTAINING

DIRECTIONS FOR THE PREPARATION OF THE GROUND FOR THE

ORCHARD AND FRUIT GARDEN,

PLANTING, PRUNING, &c.,

WITH

LISTS OF FRUITS RECOMMENDED BY THE AMERICAN POMOLOGICAL SOCIETY AND THE SEVERAL STATE SOCIETIES.

ALSO,

PLAIN DIRECTIONS FOR MAKING AND PLANTING THE

LAWN AND FLOWER GARDEN,

AND

A CATALOGUE OF NURSERYMEN

IN THE UNITED STATES AND CANADA.

ILLUSTRATED WITH 60 ENGRAVINGS,

REPRESENTING VARIOUS FORMS OF TREES, LEAVES, AND FRUITS, PRUNING, DESIGNS FOR PLANTATIONS, ETC.

ROCHESTER, N. Y.
JAMES VICK, JR.
1856.

ENTERED ACCORDING TO ACT OF CONGRESS, IN THE YEAR 1855, BY
JAMES VICK,
IN THE CLERK'S OFFICE OF THE DISTRICT COURT OF THE UNITED STATES FOR THE
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STEREOTYPED BY J. W. BROWN,
Rochester, N. Y.
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PREFACE.

THE public, and particularly those engaged in the culture of Fruit and Fruit Trees, have long felt the need of such a little hand-book as is now presented for their approval. It has not been the aim of the publisher to present a showy work, but one of real utility. He does not claim for it entire originality, and a few pages have been given from *Cole's Fruit Book*, *Barry's Fruit Garden*, and *Thomas' Fruit Culturist;* though, perhaps, in this respect, it is equal to any work on the subject before the public. The article on *Fruit Culture* was prepared by H. E. HOOKER, Esq., a gentleman well and familiarly known to the fruit growers of this country. Dr. J. A. WARDER, of Cincinnati, is the author of *The Vineyard*, a subject on which information is now eagerly sought. The *Flower Garden and Lawn* was written by R. R. SCOTT, a thorough botanist and skillful florist. The object of the publisher, as originally stated, was to "furnish a HAND-BOOK for the inexperienced planter—a guide to those about to commence the formation of orchards and gardens—a work at once RELIABLE, and so cheap as to be within the reach of all." If he has succeeded in this, his highest aim in the preparation of this work is gratified.

JAMES VICK, Publisher.

ROCHESTER, N. Y.

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PREFACE.

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The Fruit Garden and Orchard.

INTRODUCTION.

IN the cultivation of Fruits and Flowers we have the poetry of earth-culture. It affords every thing that can please the eye or gratify the taste. What can equal the beauty of the flower or the deliciousness of the fruit. Of the former it has been said, "SOLOMON in all his glory was not arrayed like one of these,"—of the latter, "its praise is in every mouth."

As good fruit becomes more common, and accessible to a greater number, those fevers and bilious disorders so general in new countries where fruit is scarce, will become lessened, and health and happiness increased.

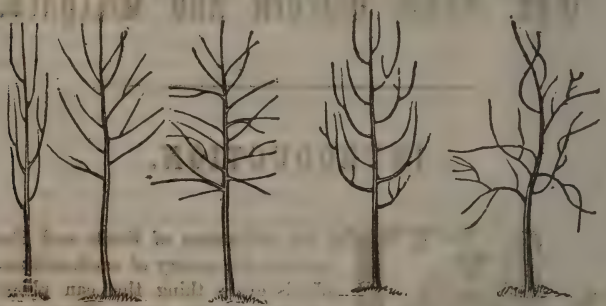
How delightful is the succession of Fruits. First in the spring, when we are impatiently waiting for the season of luscious fruits, comes the Strawberry, deliciously smothered in cream, giving a new zest to life; then follows the Raspberry, filling the room with fragrance; then the Cherry, and the Currant and Gooseberry. Then comes the Apricot, the Peach, the Plum, and though last, not least, the Apple,—all forming a delightful succession of nature's best gifts. Our present object is not, however, to urge the importance of Fruit culture, but to give such information as is needed to enable the cultivator to do his work well, and thus secure both pleasure and profit, as the reward of his labors.

EXPLANATION OF TERMS.

There are certain terms used in describing fruit and trees, that it will be necessary to understand before the reader can gain a very definite

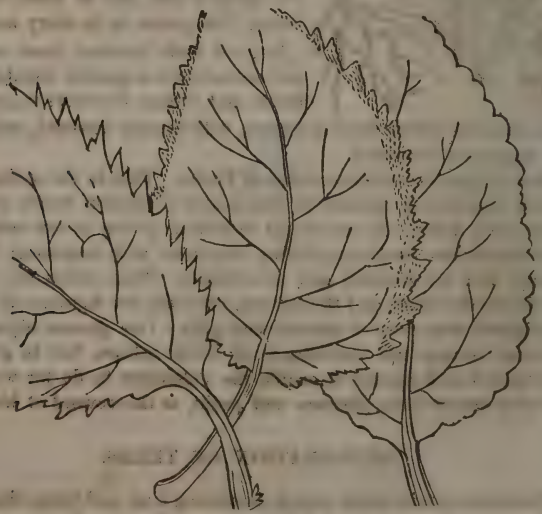
idea of the appearance of fruit from the published descriptions, or be able thereby to identify sorts. Many trees have such distinctive and marked characters of growth, that they may as readily be known by their branches and leaves as by their fruit.

The shoots are described as follows

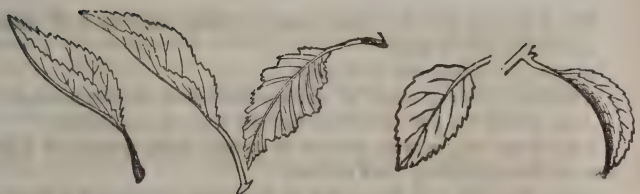


Erect. *Diverging.* *Spreading.* *Ascending.* *Straggling.*

Leaves.—The following terms are used to describe the different forms of the leaf:

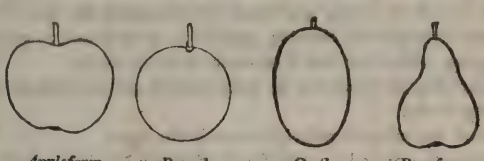


Sharply Serrate *Doubly Serrate.* *Crenate.*

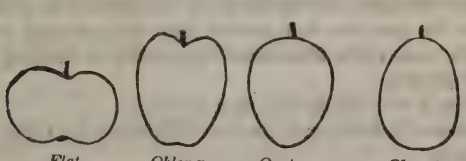


Even. *Waved.* *Wrinkled.* *Flat.* *Folded.*

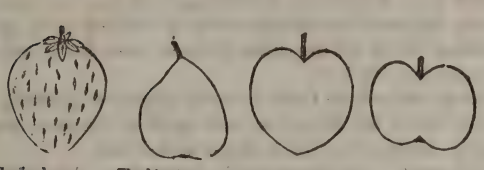
FRUIT.—The following are the principal terms used in describing the forms of fruit:



Appleform. *Round.* *Ovul.* *Pearform.*



Flat. *Oblong.* *Ovate.* *Obovate.*



Conical. *Turbinate.* *Heart-shaped.* *Angular.*

The *Stem* is also called *stalk*, and the hollow in which it is set is called

Cavity, which is of various forms.

The *Calyx* is the remains of the blossom, and the parts of it are called segments. The calyx is generally in a depression or

Basin, which is of various shapes, and is smooth, waved, furrowed, plaited, or notched.

Suture is a hollow or furrow on stone fruit, extending lengthwise round, nearly round, half round, or partially round it. It is peculiar to peaches and plum.

The following are the more common terms used in fruit culture:

Acute, sharp or angular.

Acuminate, drawn out to a point.

Alburnum, the sap-wood, as distinguished from the heart-wood.

Apex, point, the part of a fruit farthest from the foot-stalk.

Base, lower end, or that portion of a fruit, stalk, or part of a plant, nearest the supporting part or root.

Basin, the hollow or depression at the apex or crown of a fruit, surrounding the calyx.

Beurre, a buttery pear.

Calyx, the outer or green leaves of a flower, which, remaining on the apex of a pear or apple, are often denominated the eye.

Canes, long bearing shoots; applied to grapes and raspberries.

Clipping, trimming down to some definite shape.

Colmar-shaped, pyriform or pear-shaped, with a rather slender neck and large body.

Conical, tapering regularly towards the apex.

Cockscomb, applied to the form of strawberries when much compressed at the sides, and having some resemblance to a Cock's comb.

Crown, the part of a fruit farthest from the foot-stalk or base.

Dwarfs, trees made diminutive by grafting or budding upon stocks of small growth.

Espalier, a tree trained flat upon a trellis.

En quenouille, training to produce fruitfulness by tying the branches downwards.

Fibrous roots, the smaller, branching, or thread-like roots.

Forcing, the early ripening of fruits by artificial heat under glass.

Head back, to cut off the entire limbs or branches of a tree, or to cut down to an inserted bud.

Lay in by the heels, to bury the roots of trees temporarily in a trench.

Leading shoots, the longest or main shoot of a limb or tree.

Lopping, cutting the branch down to the stem.

Maiden plant, a tree of one year's growth from the bud or graft.

Mulching, covering the ground about a tree with straw or litter to prevent drying.

Oblate, flattened, so that the shortest diameter is between the base and apex, like a flat turnip.

Obovate, reversed ovate, being largest from the foot-stalk or towards the apex.

Obtuse, rounded or blunt.

Pedicel, the subdivision of a flower or fruit stalk.

Petals, flower-leaves, usually colored.

Petiole, leaf-stalk.

Pippin, an indefinite term applied to various apples.

Pomology, the science of fruits.

Pyramidal, like a pyramid, usually nearly similar to conical, but longer.

Ringing, the removal of a ring of bark round a branch, to impede the descending sap.

Serrate, notched or cut like saw-teeth.

Shanking, a diseased shrivelling of the foot-stalks of grapes.

Shorten-in, to cut off more or less of the outer parts of shoots.

Spongiole, the minute spongy extremity of a fibrous root.

Sport, an unusual departure or variation in a new seedling

Spur, a short stubby shoot bearing fruit or fruit-buds.

Standard, a fruit tree in open ground, or not trained to a wall or trellis.

Stock, seedling tree, which supports the inserted bud or graft.

Stop, to pinch or cut off the point of a shoot, to prevent its further extension or growth.

Strike, to emit roots.

Tap-root, the main or central descending root.

Trellis, an upright, flat frame, for training fruit trees and grapes upon its face.

Work, a term applied to the budding or grafting of trees.

DIFFERENT KINDS OF SOIL.—Soils are usually designated by terms expressive of the predominant material in their composition, thus we hear of *sandy*, *loamy*, *gravelly*, *clayey*, *calcareous* or *chalky*, and *alluvial* soils.

A sandy soil is that in which sand is the principal ingredient. Such soil is usually quite defective. It is so porous that it parts almost instantaneously with moisture, and plants in it suffer from drouth. All the soluble parts of manures are also quickly washed out of it, and hence it requires continual additions to produce even a scanty growth.

A clayey soil is that in which clay predominates. It may be considered the opposite of sandy, inasmuch as its defects are, that it retains moisture too long, is too adhesive, in dry weather it becomes as hard as a burnt brick, impervious to dews or light showers, and when thoroughly saturated with wet it is tough, and requires a long time to dry.

A gravelly soil is one made up in greater part of small stones, pebbles, decomposed rock, &c.

A loamy soil is one we hear a great deal about, and may be understood in various ways. It may be considered a mixture of equal parts of sandy, clayey, and vegetable soil. It is neither so light as the sandy, on the one hand, nor so tenacious as clay on the other; and, as a general thing, contains such elements, and is of such a texture, as to render it eligible for all ordinary purposes of cultivation, and especially so for

fruit trees. Loamy soils are spoken of as *sandy loams*, when sand forms a large ingredient, say one-half of their composition; *gravelly*, when pretty largely mixed with small stones; *calcareous*, when lime is found in them.

Calcareous or chalky soils have a large amount of lime mixed with the other ingredients of which they are composed. All the lands in limestone districts are of this character.

Peaty soil consists chiefly of vegetable mold from decayed marsh plants, in low, wet places.

Alluvial soils are composed of decomposed vegetable substances, the sediment of rivers, and the materials washed down from neighboring hills; the valleys of all our rivers and streams are composed of this, and it is the richest of soils.

PREPARATION OF THE GROUND.

BEFORE undertaking to prepare a piece of soil for a fruit orchard or a garden, it should be borne in mind, that some pieces of land are utterly unfit for either purpose. Others again can be made to answer tolerably well for the flower and vegetable garden, while not really fit for growing fine fruit.

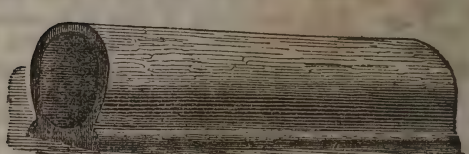
It is of little use to grow fruit of any description, if after it is produced it is insipid and unpalatable. Fine fruit can only be grown upon a soil naturally or artificially dry and firm. A *wet soil, or a very loose peaty one, never produces fine fruit.* Sandy soils, gravelly soils, or clayey soils, as well as what are called loamy soils, can all be made to grow fine fruit if properly cultivated, provided the *subsoil* is porous enough to permit the water to escape rapidly downwards, a sufficient depth to allow the roots of trees at least three feet of soil, which is never filled with stagnant moisture; and the greater the depth of perfectly drained soil, the greater the certainty of success.

Let, then, this be borne in mind, *a dry subsoil is indispensable* for a fruit orchard. "What shall I do then?" says some one whose small lot does not admit of much choice as to situation. "My land is *all* wet, and I too want my Cherries and Peaches, my Pears and berries of various kinds." We shall not deny that you are badly off, but something can be done, first, by deep and *thorough draining.* If you are so situated that a rapid descent can be had you will do very well. Get some drain tiles if practicable, and lay them in about three feet deep, at greater or less distance, according to the nature of the soil. If it is flat, and the descent not great, lay them in parallel lines about thirty feet apart, running from the lowest to the high ground, all discharging, if possible, into an *open* drain across the lowest land, that you may always see the

mouths of each. If there be high ground above you, it is generally best to run one drain across the upper ends, to catch the water from above. In some cases land is made wet by the bursting out of springs or slowly escaping water from the higher land around. In such cases it may be drained by passing a deep drain *along* the hillside, leading the water around the land to be drained, and thus reclaiming it.

The practice of draining not being generally very well understood, we will explain the process: Drain tile are of several descriptions, but only two sorts are common, the horse-shoe and the pipe; they are 15 inches in length, and cost from $10 per M. to $40 per M., according to the size—2-inch pipe is the most commonly used, and the best for ordinary drainage, being easily laid, and sufficiently large for any but main drains with branches discharging into them.

HORSE-SHOE TILE.



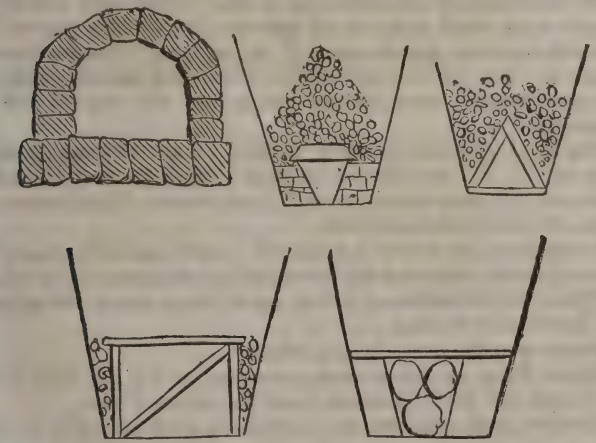
SOLE TILE.

They are laid by opening the ditch about three feet (if you go down three feet into the soil) wide at the top and tapering rapidly down to a width just sufficient to lay the tile in at the bottom—the workman not walking in the bottom, but removing the last of the soil with the draining gouge, made for the purpose; where this tool is not at hand, the bottom must be made wide enough to admit the workman standing with one foot before the other. By this method the old subsoil is not disturbed, and the tiles lie for any length of time without being displaced. The pipes are simply laid end to end, the water finding its way in readily at the joints. A covering of straw or turf should be laid over the tile before filling in the earth, after which fill and pack as hard as you please; you can not keep the water out of them.

When horse-shoe tile are used, as for main drains, and where a great quantity of water is to be carried off, or where the bottom is quicksand, or not sufficiently firm to make it safe to trust pipes, boards must be laid

in the bottom, and the-horse shoe tile inverted upon them, and covered in the same manner as heretofore described; but for common draining we have found the pipes quite sufficient, the only instance of failure being where, on steep hillsides, the current escaping a little from the tile loosened the soil and displaced the pipe; this caused an obstruction, and the great pressure above burst up the drain, and the water again came upon the surface. This can only be prevented by careful laying and firm packing around the tile.

Where drain tile can not be had, open your drains in the same manner, leaving only a very small channel for the water, commence filling this with small stones from the size of an egg upwards, throwing the smallest in the bottom, using larger ones above until about six inches is filled with stone, over this lay turf inverted, or straw, and then pack hard to keep the water from washing earth down among the stones. If the subsoil is stiff and clayey, these drains will not fill up. We have such which have worked admirably for the past nine years without obstruction or repair. Care should be taken that the mouth has a free passage, and that the water channel is deep and in solid soil, the loose stones will then afford a sufficient channel for the water, and there being no opening, vermine cannot get in and block them up, as frogs and mice do sometimes, where an open drain is laid, even of tiles. The following engravings will enable the reader to form a very good idea of other methods of making stone drains.



Having secured a dry spot, let us proceed to the next requisites.—There is no doubt but a strong loam, as we call it, and a *naturally* dry

subsoil are the best situations. If you have these, nothing will be required as preparation except deep cultivation and a liberal manuring, if the soil be not already rich. Different varieties of fruit require more or less manure.

The CHERRY should not be very highly manured, especially the *Heart* and *Bigarreau* classes, as high manuring causes so rapid a growth as to endanger bursting of the bark upon the body and main branches, and also increases the danger of winter-killing.

The PEACH, also, although good for nothing in a turf, or if deprived of good cultivation and frequent stirring of the soil, is not benefited by any excess of barn-yard manure. A simple crop of Wheat, Oats, or other sown crop, will almost ruin a Peach orchard; while Potatoes, Beans, roots, and even Corn will not injure the trees, especially if not planted too close to them, and accompanied with light manure.

DWARF PEARS, on the contrary, being worked upon Quince stocks, require high cultivation and liberal manuring. The Quince roots being fibrous and not disposed to go deep or far for nourishment, must have a liberal supply near by, to enable them to meet the great demand which the Pear in its productive state makes upon the roots. Soils with a considerable proportion of clay are consequently well adapted for these trees.

The PLUM, also, seems to prefer a stiff soil, and will bear liberal manuring.

The PEAR upon its own roots, that is, when worked upon Pear stock, is quite easily suited as to soil and manure; but if highly manured its rampant, succulent growth makes it an easy prey to the fire blight if attacked. Deep and thorough stirring of the soil is generally sufficient for them, without much manure, but in poor soils manure will be necessary.

The APPLE is perhaps the most tractable of all the fruits; growing upon all soils, and struggling along under great difficulties; but it will show care and manuring as soon as any, and should be liberally manured when the soil is not already rich.

GRAPE VINES also delight in being well manured, and will not give the best satisfaction without a dry bottom, and an abudance of rich soil.

Where the circumstances permit one to choose among various soils, we should prefer to plant

PEARS upon the most clayey portions.

DWARF PEARS on Quince stocks upon clay; and if any trees are to go in cool and damp situations, plant the DWARF PEARS.

CHERRIES, only upon dry, warm situations, sandy, gravelly, stony or loamy.

PEACHES do best on sandy loam, gravelly or stony land, and even upon quite poor sand.

PLUMS do best on clayey loam.

QUINCES do best on rich clayey loam.

GRAPES, and all the berries and small fruit, do best on a strong loam, dry and rich.

There being a great difference in soils, of course they vary more or less from that which experience has proved best adapted for fruit culture. Taking what is called a strong loam as the standard, we find that it will be beneficial to add to the sandy portions such materials as will have a mechanical tendency to make it firm and retentive of soluble manures, such as clay and leached ashes, plowing in green crops, &c., &c., as well as more frequent manuring with stable manure than is necessary upon heavier and more retentive soils.

Very heavy clays, on the contrary, although retentive of soluble manures, are not retentive of moisture during drouth, because they become baked, and so hard that moisture is rapidly carried off from the surface; and not being in that proper medium of density which permits capillary attraction to draw up the stores of moisture from below, while yet retaining its own in possession by a minute division of its surface into numerous air chambers, which check the conduction of heat.—Heavy clay soils, therefore, require such treatment as will render them more porous, and more easily capable of minute subdivision. This is best accomplished by the addition of strong manures, chip dirt, or leaf mold, or swamp muck which has been mixed with quick lime and allowed to stand exposed to the sun and frost for several months; if the soil is poor as well as clayey, barn yard manure will soonest show a beneficial effect. Gravelly and stony soils seldom need much besides manure and cultivation.

We have said that *deep cultivation* is necessary to the best success; next to thorough drainage we consider this indispensable. The difference between *fine* fruit and a poor or even common article, pays too well for care and expense in the beginning, to allow us to pass this subject without remark. Some limited portions of land are naturally so deep and fertile, that splendid fruit is grown with little trouble of this kind in preparing the soil, good deep plowing or spading being all that is really necessary; but commonly subsoil plowing for large orchards and trenching two feet deep are desirable preparations for fruit growing.

If the subsoil plow is used, let it not be used as a *substitute* for draining or manuring. If the land is not well drained, the subsoil plow only makes matters worse than ever, except in those rare instances where the plow penetrates *through* the hard-pan which retained the stagnant water, and thus makes drainage. Commonly it will make wet land more utterly worthless and muddy, without corresponding benefit by deepening the soil. Drain first and deeply, then subsoil if it is not naturally dry.

Trenching is the most complete and, for the Garden, the best prepara-

tion. The operation is performed by opening a trench three or four feet wide and one foot deep, across one end of the land to be trenched; the bottom is then broken up to the depth of another foot, and generally well mixed with manure. The top is then taken off from another strip of the same width, and thrown upon the last space, filling it up again, and still leaving the surface soil upon the top. When the whole is completed, the soil first thrown out is wheeled back to fill up the last trench. In some cases the trench is open to the whole depth first, and the surface soil of the next strip thrown into the bottom. This inverts the *whole* soil, and is probably best, but it requires more manure mingled with the soil which is left uppermost, to give good growth at first.

The present condition of the soil upon which it is proposed to plant trees, should modify the treatment which it is to receive. Thus, if it be in green sward, subsoil plowing is not very practicable; but deep plowing with the double mold-board plow, or double Michigan plow, as it is called, turning under a coat of good stable manure, will prove a first rate preparation. Trench plowing, which is performed by passing a second plow along the furrow formed by the first, answers the same purpose, and where the subsoil is open and free from hard-pan this treatment is sufficient. Where the land has been cultivated the previous season with some hoed or grain crop, subsoil plowing, being the deepest, is probably the best preparation.

In the choice of manures to be applied to the land for the Orchard or Garden, do not be too sanguine of the virtues of what are called special or specific manures; they are generally specially dangerous and expensive, and specifically injurious to the very things you wish to benefit. The science of Agricultural Chemistry, although promising much in the future, has proved itself quite too much of a novice to allow us to forsake the barn-yard for the laboratory, or to exchange the dung heap for the ashes of some fossil mountain. If you go outside your own bounds for manures, let it be for some substance with which you are personally acquainted in its history and its effects. Look to the trees already growing upon or around the land you propose to plant, and if they show, under good cultivation, without "special" manures, rapid growth and a healthy habit, along with fine colored and fair sized fruit, you may reasonably expect to succeed; but if otherwise, you do not find your neighborhood growing good specimens of fruits or trees, do not flatter yourself that you can, by means of some "specific" or panacea of the Professor, do away with all the causes which have discouraged them.

We do not intend by these remarks to throw the least obstacle in the way of science, or to disparage the worth of her discoveries; they are to be valued and carefully tested, but not depended upon until thoroughly tried on a small scale, and under various circumstances.

A kind Providence has provided just about us and in our way, in fact made them a nuisance to us where they are, those very substances

which by removal and application to the soil, will be found to contain most of the elements of increased fertility, and the best food for hungry trees and plants.

Soils which are hard and stubborn, not easily pulverized, are not generally considered favorable, but labor will frequently make them so. Deepen them frequently, and they must become more friable; but be careful not to handle such land when it is wet, either from recent rain or before sufficiently dry in the spring. Nothing seems to take the life out of such soils more than moving them while filled with water. Defer your planting until the ground is dry enough, or if it will not get dry conclude to try another spot.

The directions we have thus given, although mainly intended to apply to the Orchard and Fruit Garden, are as a whole applicable to the Flower and Vegetable Garden. We need only add, that as smaller spaces are usually devoted to the latter departments, the expense of trenching will not so often be avoided, and the extra manuring which some garden vegetables will bear with advantage, should be given them.

PLANTING, PRUNING, &c.

THE season chosen for transplanting fruit trees is a matter of considerable consequence. As a general rule trees set in the spring do the best, for the following reasons: At that time the transplanting can be done after the soil is thoroughly prepared for the summer's growth, by spading or plowing, raking, &c. It is thus more sure to be in a mellow condition, favorable to the spread of the new roots and the access of water and air to the soil; though, of course, ground can be made fit at any season. The trees, also, have been enabled to withstand the severity of the winter better from not having their roots disturbed,—this is of great importance to *Evergreens* and *half-hardy* trees,—and are consequently better stored with material for their first start, which is usually made almost entirely independent of their new roots, which have not yet begun to form. Trees obtained from the nurseries are often observed to bear far more hardships in transploration to distant places, and exposure to the air from bad packing and accident, when shipped in the spring than when shipped in the fall, and for the reason that their cells and tissue become filled up during the fall and early winter with organizable matter, which sustains the vitality of the tree, and enables it to issue new leaves and emit roots, which in due time become vigorous and healthy. After great exposure it frequently happens that a shrivelled, dry looking article received in the spring, far outgrows the freshest and brightest trees received in the autumn, and allowed to bear the cold of a northern or western winter without protection of any sort; and for the obvious reason that one has an empty and the other a full system.

Fall transplanting, on the other hand, has some advantages, and when properly done these advantages may be made very serviceable. One

of these advantages is convenience. The short time allowed us in the spring for plowing, planting and all the other operations of the Garden and Orchard (coming just when all other agricultural operations claim the time of the cultivator,) gives little time for proper care in the operation. Another and a greater advantage is, that many varieties of trees and plants set in early autumn form roots, and do actually store themselves with matter for spring use, enabling them to make as rapid a growth as if never removed, and even perfecting the finest specimens of fruit, as we have frequently seen upon Dwarf Pear trees the summer after fall transplanting; and even where roots are not actually emitted, the ends of the old roots granulate, and the soil during the winter becoming firmly imbedded around them, they improve the earliest opportunity to grow and prosper. *Evergreens* should always be exempted from fall transplanting, as the foliage remaining upon them, the demand upon the roots is too severe, and the winter winds almost invariably destroy the beauty if not the entire vitality of the plant. The best season for removing *Evergreens* is rather late in the spring, just as the buds commence to start. The roots should be immediately puddled, and never exposed for a minute to the sun or wind. They will then grow with as great certainty as any other tree.

Fall transplanting, if done in a climate where the winters are mild, and the situation of the Orchard or Garden not much exposed to severe or long continued winds, is generally attended with excellent success. The remarks we have made are principally applicable to northern latitudes and prairie countries, where the searching winds of winter meet no obstacle in their course.

The autumn season also allows the purchaser who procures his trees from abroad time to get them home and ready for planting out, whereas the delays of spring navigation and the press of business often detain packages a long time, and sometimes disappoint the planter altogether by coming to hand in bad order or so late that he has not time for carefully preparing and manuring his land; land ought, however, to be prepared long enough before hand to obviate this objection. Trees, also, are often received in very good order after great delays, and very dry looking subjects grow finely if properly attended to.

We would recommend that trees for northern latitudes, and in localities exposed to severe, drying winds, and pinching cold during winter, be procured from the nurseries in the spring: or, if procured in the fall let them not be set in the orchard, but carefully laid in by the heels in some dry and sheltered place, protected alike from the winds and the bright, direct rays of the sun. We have known excellent success from burying entirely in the earth, upon a dry spot, during winter; and on the whole we presume this is the safest plan, and where the quantity of trees is not large, the cheapest.

It is well known that a slight covering of earth preserves the Grape, the Raspberry, and other tender plants during winter, and we see no reason why all trees liable to suffer may not be so protected where it is practicable, as in the case of trees taken up for transplanting.

Trees, particularly of the hardy kinds, for mild or southern climates, had best be procured and set in the autumn, particularly if they are from northern nurseries; the spring opens so much later in Western New York than it does in the vicinity of the Ohio River, that trees forwarded as soon as possible in the spring, arrive rather late at their destination at that place. However, the difficulty is not so great as many suppose, because trees, if in a dormant state, when brought into a warm climate and a growing atmosphere push on immediately, and seldom fail to do well under good management. The danger is that the warm weather will excite the plants into too much growth while in the packages and on the way. These difficulties will be in a great measure overcome by good packing, and proper diligence in forwarding by our nurserymen and railroad agents.

We give these thoughts the more prominence because now-a-days few farmers or amateurs raise their own trees, but depend upon the extensive nurseries which now abound in our country, and which furnish better trees and cheaper than the farmer can grow by the small quantity for himself, while they afford him a larger variety of kinds to select from than he could otherwise procure; and nurserymen generally make better selections than any man not well acquainted with fruits could do.

Having procured the trees and properly prepared the ground, proceed to stake it out at regular distances, using great care to lay out the plot at right angles, as if this is not done the trees will not line in the several directions. It is best to plant in squares, as this gives the best facilities for working the land, and the little advantage obtained in situation by planting in the quincunx form, as sometimes recommended, is not a compensation for the loss of convenience in the care of the ground where horses or oxen are to be used. Indeed we prefer the square form for all plantations, as the simplest, easiest to lay out, and most beautiful after it is perfected.

Set a straight stick or lath in the spot to be occupied by the tree, as these are more easily arranged than the trees themselves. If a large number of trees are to be set, it is convenient to use a simple instrument of the following description, to save the trouble of sighting: It is nothing more than a stool having a tongue or swinging stick with a notch in the end. The stool is set down so that the notch in the end of the tongue just fits the lath or stick set upon the site of the tree; when adjusted, the tongue is thrown back, and as it is five or six feet long, room is made for digging the hole; when this is done the tongue is brought to its place again, and the *tree* being placed in the notch

necessarily stands just where it should. We have found this simple tool a very great saving of steps in orchard planting. Another great saving is to prepare a good line, by spacing it off at proper distances, and passing bits of red tape or twine between the strands at each spot. With these tools much time may be saved, and the work done in the best manner.

The following figure exhibits a mode of arrangement which may be adopted where trees growing to different sizes are to be placed in the

FIG. 1.

same enclosure, giving different spaces for each tree according to its need, and yet placing all in rows so as to allow horse-cultivation both ways. The larger growing kinds, as Apples, Pears, Cherries, &c., occupy the wider rows, and Dwarf Pears the narrower. Those of intermediate size, such as Plums and Apricots, are planted at medium distances. These being liable to be stung by the Curculio, occupy one end of the enclosure, so that as soon as the young fruit begins to form, a temporary fence (*a a*) is run across, and pigs and poultry confined in this part. These animals prove one of the most easy and efficient destroyers of the Curculio, eating all the punctured and wormy fruit that falls.

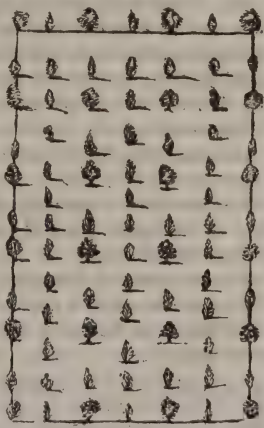


FIG. 2.

Barry's "*Fruit Garden*" furnishes the annexed plan for a *Pear* orchard.

"Standard Pears do not require so much space as Apples, their branches generally being more erect. In this country Standard Pears should not have naked trunks over four feet high at most, and twenty-five feet apart is quite sufficient; at this distance an acre will contain about seventy trees. These, as a general thing, will not begin to bear until the tenth

year, unless artificial means be resorted to. By putting one pyramid, or low standard, between each in the same row, and a row ten feet apart between each row of standards, as in fig. 2, we can plant 250 dwarfs, or pyramids, that will commence bearing the third year, and will be in full bearing the fifth, yielding not less on an average than $1 to $2 per tree.'

The following remarks on the distance trees should be set apart, which are as nearly correct as may be given for general application to different varieties and soils, are copied from the *American Fruit Culturist:*

Apples.—In fertile districts of the country, where the trees may attain great size, and where there is plenty of land, 40 feet is the greatest distance required. The usual distance is two rods, or 33 feet. Where the most is to be made of land, and where thinning-in the limbs is practiced when the trees become too large, 25 feet distance may be adopted. For pyramids on apple stocks, 10 feet; for pyramids or dwarf standards on Doucain stocks, 8 feet; for dwarf round-headed trees on Paradise stocks, 6 feet.

Pears.—Large growing standard varieties, on Pear stocks, 20 feet; dwarf standards on Quince (with stems pruned up two or three feet, the heads with natural growth, or slightly thinned by pruning once a year, for orchard culture,) 8 feet; pyramids on Pear stocks, 8 to 10 feet; on Quince, 6 feet. It should never be forgotten that Pears on Quince should be so placed as to admit of high or enriching cultivation. It is quite useless to plant them and then neglect giving them the best care.

Peaches.—It is usual to allow from 15 to 20 feet for Peach trees that are never shortened-in, but permitted to spread out and take their natural course. Peach trees budded on the Plum, which reduces their growth a little, may be kept cut back so as to require a space of only 8 or 9 feet

Cherries.—Common standards, 20 feet apart; pyramids on common stocks, 10 feet; on Mahaleb stocks, 6 feet. Dukes and Morellos require only three-fourths of this space.

Plums.—Standards, 15 feet; pyramids, 8 to 10 feet.

Apricots.—One-fourth more space than for Plums.

Quinces.—6 to 8 feet.

Grapes.—Most vigorously growing native sorts, on a trellis 8 feet high, 25 feet apart; on a 12 feet trellis, 16 feet apart. Foreign Grapes, one-half this distance.

Gooseberries and Currants.—4 to 5 feet.

Raspberries.—3 to 4 feet.

For the above distances, the following is the number of trees required for an acre:

40 feet apart,	27 trees.	12 feet apart,	302 trees
33 "	40 "	10 "	435 "
25 "	69 "	8 "	680 "
20 "	108 "	6 "	1,208 "
15 "	193 "	4 "	2,270 "

If the ground is well plowed or spaded, and made mellow and friable, the holes need be dug no larger or deeper than just sufficient to spread the roots out in their natural position. The hole should be just deep enough to allow the tree to stand as deep, or a couple of inches deeper, than it stood in the nursery, as indicated by the collar of the tree, or if a dwarf tree, deep enough to allow the whole stock below where it has been worked to be buried in good soil. Where the soil is shallow, the subsoil should be made rich, that the lower roots may not perish; and if the soil be naturally deep and porous, deeper planting than is otherwise desirable, will be necessary. Trees on deep prairie soil will bear plunging to a depth that destroys them if practiced on a shallow or stiff clay soil.

When it is desirable or necessary to plant in land already stocked with wheat or other grain, or upon grass land, dig the holes *large* and pretty deep; but not so deep as to make a tub or well of rich soil in which the roots will flourish a few months or perhaps years, and then arrive at their journey's end, or otherwise a place for water to settle and stagnate. The ground just about a tree should be made good enough to start the tree rapidly and vigorously, that it may thereafter progress without delay, but not mingled with a great supply of strong or fresh manure.

In grass or grain it will be necessary to keep a large space around the tree thoroughly mellowed and free from vegetation of any sort; a space six feet in diameter is little enough for any tree to have, of good soil well hoed or mulched; four feet will preserve the tree, but not give the growth that is to be desired.

The process of planting is very simple and may be done rapidly, only keeping in mind that the soil must be brought firmly in contact with the roots. The best way is to take the hands and crowd the rich, mellow surface soil closely in among and above the roots, leaving no holes about the stem or underneath the body and main roots. Dashing in a few quarts of water when the hole is nearly filled, to settle the earth closely among all the fine roots, and leave no interstices, is a good plan. Previous to planting, trim the ends of the roots with a knife, cutting off all bruised portions; this will facilitate the formation of new roots, and prevent the decay of any parts which have been injured. If the roots have been much mutilated in digging up, or by other causes, it will be necessary to shorten back the top in the same proportion, in fact it is always best to do so. The removal of a tree of necessity deprives the roots of their power to supply at first a full supply of nutriment for the leaves, which continue their action unless cut off. By reducing the top we reduce the number of leaves, and thus leave those which remain in equilibrium with the roots. The better way to reduce the top is by heading back, that is by cutting off the ends of all the last year's shoots,

leaving more or less buds, according to the greater or less loss of roots, and as the preservation of the form or symmetry of the head of the tree will admit. One-half of last year's growth will usually suffice.

Planting should never be done when the land is wet, as the soil is likely to become baked and hard around the roots, if done at such times. It is well to wet the roots, or better to dip them in mud, or *puddle* as it is called, before planting; this coats the roots with clay, which is almost air tight, and saves the fine roots from injury from the sun or wind during the operation.

After the planting is finished, it will be highly desirable to *mulch* all the trees. There is no method of preserving trees recently transplanted equal to this; it is also true that no treatment is becoming so universally popular; even well established trees are now treated to a dressing of this kind in many excellent plantations. It seems just suited to our sunny and variable climate, preserving the moisture, preventing the growth of weeds, and supplying manure. Mulching consists in covering the ground about the tree, to a greater or less distance, according to the size of the plant to be treated, with some material like straw, grass, sawdust, manure, (strawy manure is especially good,) shavings, or some similar substance, spread on thick enough to shade the ground and prevent the growth of weeds. Three to six inches of mulching well beaten down, and covering a space of not less than three feet in diameter, and in cases where grass or grain crops are growing, four to six feet in diameter, will do more to preserve trees from drouth, and to promote their growth, than any other course we know of. It is cheap, safe and effectual. No watering will then be necessary — in fact, we always deprecate this practice, as it does more harm than good in almost every instance. No further care of the ground will be required during the season, beyond the removal of a stray weed or dock which may spring from the manure used for the purpose. Fruit or other trees set upon lawns, are generally preserved by piling the short grass mown from the lawn about their roots.

We have strongly recommended mulching; because, during the press of farming work, and the multitude of calls upon the time of the farmer, hoeing, or spading and raking about fruit trees, will seldom be attended to; nevertheless, spading and hoeing will, if done well and thoroughly, in almost all cases preserve the tree from drouth, and promote rapid growth. Where this is relied upon, spade a large space and hoe frequently, if your trees are not set among hoed crops; if they are, they will of course receive their share of attention during the cultivation of the crop, and thus not need especial care.

It is necessary to continue the careful cultivation of young trees for some years after planting, and some species of trees never endure much neglect or ill-treatment, even for a couple of years, without becoming

utterly worthless. Two years bad usage will generally destroy a Peach orchard, and two years of over cropping and starving will ruin the most flourishing dwarf Pear tree. No man then, of good sense, considering the great value and the permanent income to be derived from good fruit trees, will allow them to suffer for the sake of the grass or wheat he may obtain from his orchard land, to the destruction of his trees. Once well established, Apple trees and Pear trees upon Pear stocks will suffer no material injury from being allowed to grow in land cultivated in the rotation of crops which is generally pursued by our farmers; but Peach orchards should never be seeded down or a crop of grain raised among them. Low hoed crops, such as potatoes, beans, beets, &c., for the first three years, after that clean cultivation with the plow and cultivator, pays best. Plantations of the finer fruits, such as Dwarf Pears, Cherries, Currants, Raspberries, Grapes, &c., &c., as also mixed plantations, where the standard trees are mingled with dwarf and with berries, should always be kept in cultivation; while the plants are young, moderate crops of low growing articles may be raised, but after the tree comes into full bearing no other crops should be taken off. Want of attention to this has caused many failures, and frequently we see men whose corn and wheat are costing them more than $5 per bushel in the loss of quality and quantity of fruit, saying nothing of the want of progress in their trees. It is surprising to see the lack of knowledge on this point. We will give an illustration of it:

The writer, in passing a neighbor's Peach orchard last summer, observed that a small portion of his ground was cultivated with potatoes, the balance had been sown with oats or barley; the trees were all loaded with fruit, but those among the potatoes were growing rapidly and bearing fine specimens, the balance of the orchard was perishing with drouth, making no new growth, and producing Peaches unfit to eat. Calling his attention to the state of his trees, he said he saw how it was before, but had not known the reason. This was astonishing, for the strip of potatoes ran right across his orchard, and the difference in the trees and fruit was so manifest as to be noticeable from a long distance off; the suffering trees being on each side of the thriving ones.

During a tour of observation among the orchardists furnishing Peaches for the Rochester market, we found one orchard far surpassing all others in the magnificence of the fruit. In this orchard the trees were planted about 24 feet apart, (more space than is usually allowed,) and not a spear of vegetation allowed to appear upon the dry, strong loam. The difference in crops produced by such means, over common, half culture, surpasses the belief of men who have not seen and compared; the difference in flavor is equal to the difference in size, beauty and quantity.

PRUNING.

This subject is in itself so large, and, if entered upon in all its detail, requiring so much study and thought, as well as room, that a volume would be needed, were we to go into all the minute directions and instructions, which different and able writers have given for the guidance of the cultivators of the different fruits, vines, berries, &c. Different plants have such different habits of growth and bearing, and the different systems upon which it is proposed to conduct the several operations, are so dissimilar and widely at variance, that we must needs enter upon the principles and the philosophy of vegetable life and productiveness, were we to treat the subject thoroughly. As we cannot do this here, we shall content ourselves with glancing at some well established principles and facts, which have a direct bearing upon the matter, and leave the fruit grower to search among the writers of the present and past age, for that complete and thorough knowledge which will fit him to gain eminence in his profession, as well as enable him better to understand the reasonableness and necessity of the most common operations.

Pruning, if done intelligently, has for its object one of three things, either to *promote* the *growth*, the *productiveness*, or a *change of form* in the tree. The two first require dissimilar treatment; the last may be brought in as an incidental matter, but should always be borne in mind, as the form of the plant oftentimes materially affects the vigor of the tree and the quality of the fruit.

If pruning is done while the tree is in a dormant state, that is, during the winter or early spring, before the sap is in active circulation, the whole force of the root is thrown upon the remaining parts of the tree, without the least difficulty or disturbance. Of course the remaining buds or branches receiving a full or over supply of nourishment, burst into rapid growth, dormant buds put out, and large woody shoots are formed, and this feature is discovered to a greater or less degree, according as the pruning is more or less severe. The woody shoots thus formed, show less tendency to form fruit buds, than those feeble ones formed under a different course of treatment; and consequently on the following spring we have a tree in a better state to make rapid *growth* than we should have had if fruitfulness had been induced by the use of different means.

On the other hand, pruning, if performed just after the bursting of the tree into leaf, causes a check to the sap in some of its channels, which seems to operate unfavorably throughout the plant, and diminishes the vigor of the whole. This check is felt less severely by some plants than by others, but will hold good as a rule for acting upon. Checking the

growth of wood favors the formation of fruit buds, while it diminishes the amount of wood formed, and may thus be used to encourage fruitfulness in unproductive specimens.

Keeping these facts in view, we shall be prepared to treat the Orchard or Garden tree with such pruning as its circumstances demand. It is as absurd to adopt the same course of treatment for all trees, and under all circumstances, as it would be always to bleed the human frame for "any ill that flesh is heir to."

Fruit trees frequently become so full of fruit-bearing branches and spurs, that the tree is over loaded, and the produce consequently small and of little value. Such trees require thinning out, and especially the removal of feeble and slender shoots, which encumber the shaded portions of the tree. In connection with this, stimulate the roots, and new life is given to the tree. It should always be borne in mind that a proper proportion is to be maintained between the crop of fruit and the supply of large, healthy leaves, and vigorous young wood. A tree bearing annually large crops of fruit, but making no wood, will in a few years become stunted through the want of large, healthy sap vessels, and cease to produce fruit of any value. Occasionally trees are so situated that their annual growth is very rapid, and few fruit buds are formed. In such cases, pruning during the early growth of the season may be resorted to, in connection with such treatment of the soil as will reduce the growth of the trees — as seeding down with grass for a year or two. These cases are rare, and generally it is best to wait with patience for orchard trees, remembering that their increased size, when they do bear, will more than compensate for the loss of a few specimens obtained prematurely.

Garden trees, such as *Dwarf Pears, Dwarf Apples, Cherries*, &c., being in an artificial state, will require more attention in pruning than the standard or orchard trees. By cultivation upon a stock which tends to dwarf the tree, extra fruitfulness is induced; not only are more fruit-buds formed in proportion to the wood-buds, but extra vigor seems to be imparted to them, so that more specimens of fruit are retained upon the tree, and they are grown to a greater size. This renders the tree very liable to over production, and consequent exhaustion, and destruction of the proper balance of strength between the fruit and the leaves and the wood. This can only be prevented by carefully pruning back every winter a portion of the growth of the previous summer, thus causing the young shoots to grow rapidly and form new and healthy wood, as well as blossom-buds. Meantime a full supply of manure will be required by the roots, which are small and fibrous. If these conditions are attended to, along with proper thinning of the fruit, the results are wonderful, and fully justify the great popularity of these favorites of the amateur.

The *form* of garden trees may be made to vary with the tastes of the owner. The pyramid is just now the most popular, and most extensively adopted form; perhaps it is the best, as it is far the most easily produced in the case of Pears and Cherries. In cultivating this shape, great care is necessary to encourage the growth and spread of the lower branches by severe pruning and summer pinching of the upper and more rampant shoots.

Among the smaller fruits of the Garden, the Current and Gooseberry require a spring pruning which shall reduce the amount of bearing wood in all very productive specimens, and the encouragement of new and vigorous wood to replace the old and feeble shoots. Raspberries are pruned by shortening the tops of very long canes to about four feet, and the removal of so many of the suckers as will leave only four or six in each hill for bearing.

Grape Vines of all our fruits require most pruning; they must be thoroughly pruned in the early spring or winter, by removing such old wood as has become obnoxious or unfruitful, and the shortening back of the young wood of the summer previous to three or four eyes upon each vigorous shoot, except such as are required to fill up vacancies or to extend the space occupied by the vine. Another pruning will be required after the fruit is set and the vine is making rapid growth. At this time it is necessary to remove all feeble shoots not required for fruiting, and the pinching or stopping at a few buds beyond the young growing Grapes, of such shoots as are now bearing. Shoots intended for bearing next year may be allowed to make more growth, and not shortened at all unless they are so numerous or rampant as to injure the present crop. Grapes in the Cold Vinery or in the Forcing House, require such a course of treatment as is adapted to their peculiar situation, and not coming under the province of this article, we leave it to the writers upon that subject.

Pruning the Peach by shortening-in, or heading back the growth of the past summer, has been much commended by some very eminent writers, but fails to become a favorite practice. The Peach produces its fruit upon the wood of the previous summer. If now these shoots are cut off to one-half their length, the consequence is that one-half of the fruit-buds are cut off, and, too, from the best and strongest branches—the very branches that will produce the best Peaches if allowed to remain. The remaining wood-buds now push out, furnishing us with a double supply of shoots to make the heads dense and bushy, which although apparently beneficial, by increasing the number of fruit-bearing branches for another year, is not really so, because the branches are *too numerous, too weak* to grow fine fruit, and because they render the outside of the head so thick and impervious to the sun, that little good fruit is found except at the extremeties; increasing the very evil it is intended to

avert. The better practice is to depend upon high cultivation for a full supply of young wood, and judicious thinning of the branches and fruit where the crop is too heavy and the head too dense. A proper attention to these two points will ensure as fine success and as durable a tree as the nature of this delicious, but rather short-lived fruit will admit.

Old Peach trees are sometimes benefited by a severe heading back, which furnishes the tree anew with vigorous young wood; but several trees will die for every one that is renewed by this process. A watchful man will resort to heading back in case of an overgrown branch or portion of the tree, but indiscriminate shearing of half the last year's wood from Peach trees, is laborious, wasteful, and injurious.

The less pruning fruit trees receive while permanent vigor and productiveness are maintained, the better.

STAKING AND PROTECTION.

There remains after the planting, pruning, and cultivation of trees, still some important items to be attended to. Where plantations are made in the autumn, all trees having heads of standard height are liable to be so moved about by the winds that their roots are disturbed in the soil and injured. The tree also looses its perpendicular position. These difficulties may be avoided by staking, (fig. 1.) which is best done by two or three stakes driven at some distance from the tree, and the tree secured to them by hay or straw bands, which will thus prevent it from chafing, while retaining it in its position. A more simple, and commonly just as effectual a way, is to pile earth around the tree to the depth of one foot or more, (fig. 2.) treading it firmly; this mound turns off the water, keeps the tree firm, and secures it against mice and borers. It should be removed in the spring.

Fig. 1.

Fig. 2.

Trees set in the spring do not need staking, except in very exposed situations, and in case the trees are uncommonly large, with heads disproportioned to the roots.

Shelter from storms is very desirable, even to the most hardy trees. This trees in large orchards are more or less able to give to each other, and we frequently see the good effects of it in the abundant crops of fruit in Peach orchards of considerable extent, while scattering trees are almost destitute of fruit. It would no doubt prove a profitable investment for the planter whose land is not naturally well sheltered

from prevailing winds and easterly storms, to set a belt of Larches, White Pines, Cedars, and other free growing forest trees, which produce valuable timber, along such portions of his orchard, adding thus beauty and useful shelter.

Protection from animals is easily secured by means of a good board or rail fence, but protection from pilferers is not so easy in some localities; the only effectual means we know would be a firm, well-grown Osage Orange hedge. Until the world in general come to a better apprehension of the moral law, we believe this will be found most efficient. Protection from insects and diseases will be reserved for a separate chapter.

DISEASES

IN addition to the ordinary obstacles to the cultivation of fruit, the special difficulties of *Disease* and the attack of *Insects* require to be attended to. The work of destruction from either of these causes is often rapid and complete; but if watched, and proper remedies applied promptly, each of these may generally be overcome without great loss. The great evil is *delay, delay.* Insects multiply with such astonishing rapidity, and disease spreads so rapidly, that the dilatory man sees his fruit and his trees pass away before he is fairly awake to the danger. Be sure to meet these foes at their first appearance, and commonly you will see little of them; but once established in possession, you will have hard work to dispossess them.

FIRE BLIGHT,

As it is called, is the most serious of the diseases which attack our fruit trees in the Middle and Western States. Its ravages are confined to Apple, Pear, and Quince trees; but it is far more destructive to the Pear than to the others, seldom causing death in the Apple or Quince, even when nothing is done to stop it, but in the Pear the work of entire destruction is often accomplished in a few days. We have known trees twelve or fifteen feet high, and bearing a bushel or more of fruit, cut down by it almost in one hour, so rapid is its spread in some instances. Commonly it can be averted before causing the death of the subject, by immediately amputating the diseased part below the least trace of discoloration or putrefaction of the sap.

It generally makes its appearance on the young shoots or smaller branches, causing them to turn black and die. In vigorous young trees

the sap bursts through the outer bark in a discolored and putrefying state, sometimes smelling badly and attracting attention by its odor. In older trees this is not so readily perceived, but the discolored bark and leaves are easily detected. Sometimes the bark is first affected; and we have known cases where the body or main branches were seized upon, while all the upper portions and the outer limbs were sound for some time afterwards. The disease once established, spreads along the branch until it is communicated to the body and the root, all of which finally perish. The process is sometimes so slow that several years elapse before a large tree is destroyed, and sometimes the tree recovers without assistance, but generally a single season will complete the work. It attacks young nursery trees, and even the seedlings of a few months growth, showing conclusively that it is not caused by the winter previous. No insects are to be found whose work could cause it, we are therefore not disposed to believe that they have a hand in the matter. With all the information we can obtain, and what experience we have had, we are led to believe that, through some atmospheric state or influence, which is too subtile for us to perceive or guard against, the trees are thrown into a diseased condition, just as the human or animal system is affected by unseen causes, producing fever, or ague, or cholera; and once being diseased, it spreads and is communicated to others, in a manner beyond our comprehension.

This belief is further strengthened by the fact that some *varieties* are far more subject to its attacks than others, both among Apples and Pears, showing a greater sensitiveness to such influences in some individuals than in others. This is very apparent in the nursery, where *Blight* commencing with one variety, sometimes follows that sort along the row as long as one is left, and never leaving it to attack another sort upon either side, although closely in contact. It has been known to attack every other tree in a whole row of bearing trees, destroying each alternate one, and leaving the others untouched. In this case the trees left were all of one kind, and the trees attacked all of another. Thus is shown a marked difference in varieties in their liability to this disease.

Many persons have doubted whether this disease is contagious, but our observation leads us to the decided conviction that it is. In the nursery we usually find that limbs of other trees which touch or intermix with those of a blighted tree, are pretty certain to have the disease, and in many cases the neighboring trees die speedily after the removal or death of the one previously attacked; it is frequently necessary to clear off trees apparently very slightly touched by it, for fear they may communicate the trouble to their neighbors.

Much time and care has been spent in making observations and experiments, to see whether soils, culture, pruning, exposure, or protection, dwarf stock or free stock, manuring or starving, dosing or syringing,

would make a difference in its ravages, but the results have been very unsatisfactory. The most that we are prepared to say is, that vigorous and thrifty trees, of succulent and immature growth, die soonest when attacked; but we do not see that thrifty, even highly manured, trees are much, if any, more liable to attack than those which are stunted and dwarfed. Warm situations, with a damp and rich soil, appear to favor the spread of *Blight*, but airy hill-tops and moderately rich land is not a sure preventive.

The knife, we repeat, is the only sure remedy for the Blight. Cut early and without hesitation; remove every vestige of disease, if it cuts your tree down to the earth; and consider yourself a happy man if you do not know from experience what the Fire Blight is.

LEAF BLIGHT.

This disease makes its appearance in the form of small brown spots upon the leaves of Pear and Plum seedlings, giving them a rusty appearance, and spreading rapidly over the rows or seed beds, until the growth of all are checked, and the trees so enfeebled that little progress can be expected of them the same, or even the next season. Leaf Blight is more especially injurious to nurserymen, because its attacks are confined to young trees, and almost entirely to seedling stocks, seldom attacking the budded or grafted trees, even when the trees about them are leafless by reason of it. We are not aware of any remedy for stocks once attacked. The best preventives are, planting seeds upon fresh soil, that is, soil which has not been used for nursery purposes, and at some distance from any blocks of diseased trees; and securing for planting in the nursery row, such stock as has been free from disease the season previous.

When it is discovered that Pear or Plum stocks are seriously affected by this disease, immediate measures should be taken to have them all budded without delay if ripe buds can be procured; if allowed to remain, the bark becomes fast, and the bud cannot be inserted the same summer.

THE BLACK KNOT OR WART ON THE PLUM.

The Black Knot is truly a formidable foe to the Plum, and in some sections has quite destroyed the value of this fruit. Its first appearance is in the shape of a wart or fungus issuing from the branch in the summer, and constantly enlarging during the growing season. During the winter it becomes black, and is made the hiding place of insects, which, however, do not seem to be the cause of its original appearance. The bunch grows annually, and spreads along the branch, extending its roots

deep into the branch or trunk, until the tree is finally strangled by the number and size of its enemies.

The remedy for this is the same as for Fire Blight, namely, cut off and burn. In some cases it will do to cut out the knot from a trunk or large limb, and apply some caustic substance. We have found no difficulty in keeping a small number of Plum trees free from this pest, by the early and thorough application of this remedy.

This disease, as well as the Fire Blight, seems to have preference in its victims, the Damsons are especial favorites, and generally the blue varieties are most subject to its attacks, while one sort, the *Monroe*, (a yellow variety) is utterly exempt from injury in all this region, producing abundantly in contact with Damsons destroyed by it.

YELLOWS IN PEACH TREES.

Whatever may have been the original cause of this disease, its spread and prevalence is much to be feared, attacking as it does the young and thrifty bearing Peach orchards of some sections, and ruining them in one or two years. We cannot but dread its approach. The indications of its presence are premature ripening of the fruit, accompanied by purplish spots in the flesh the first season; the following season numerous wiry shoots make their appearance along the main branches, while the vigor of the whole tree declines, and soon after the tree perishes. It is impossible to cure a tree in a really diseased state; but as it seems to be produced by over cropping upon a rather poor and worn soil, much may be done to prevent it by careful treatment of the land, and proper reduction of the crop when the trees are too heavily loaded.

There is every reason to believe that this evil is communicated from parent to offspring, and by means of buds; cultivators should therefore use proper care in the selection of healthy stones for raising stock from, and see that no buds are inserted which come from diseased or even doubtful trees.

BURSTING OF THE BARK, OR GUM ON CHERRY TREES.

Many of the more tender varieties of Cherries are subject, in some localities, to a serious evil designated *Bursting*. There is so much difference of opinion as to the cause, that we shall not attempt to decide upon the question. In the Western States especially, and even in the Middle, this disease is of frequent occurrence.

It commences sometimes by the shrinking of the bark upon one side or in a single spot, or upon a short space extending quite around the tree, generally upon the stem. If the evil is severe and extends around

the whole stem, the tree must die; the top withers, gum bursts out around the diseased portions, strong watery shoots appear below, and the top or all of the tree perishes the same season.

Occasionally the trouble appears among the main branches, at the forks which form the top. Here it often works for some years, destroying a limb at a time, and perhaps the whole tree. We have known several cures where the diseased spots did not extend far along or around the tree, by removing the bark, clearing off all the gum and applying a plaster of cow manure, kept in place by bandages. This allows the tree to heal while protected from the sun and wind.

Where this disease is very common, it will be best to plant only the more hardy sorts, Dukes, Morellos, some of the Hearts, and a few Bigarreaus. Trees with low heads and short trunks, well protected from the sun, are said to be more free from this difficulty than the taller and more exposed trees.

MILDEW ON THE PEACH.

The young shoots and leaves, and the fruit of certain varieties, more particularly the glandless ones, such as *Early Anne*, *Early Tillotson*, &c., suffer by this disease. The only available remedy is to give the tree a good dry soil, thus keeping them in a vigorous condition. The Gooseberries are almost entirely destroyed by this disease, in Western New York. In Northern New York, Maine, and Lower Canada, the finest English sorts are brought to perfection. A cool soil and situation, and mulching the roots are the best preventives.

CURL OF THE LEAF IN THE PEACH.

This disease causes the leaf to become of a reddish color, thick, and curled, and it perishes and falls from the tree. Prof. Harris thinks it is caused by the puncturing of the under side of the leaves by plant lice. We have no doubt, however, but it is caused by sudden changes of the weather in the spring. It is always most severe when warm, fine weather is succeeded by cold rains. This being the case, of course there is no remedy.

INSECTS INJURIOUS TO FRUIT TREES.

APHIS OR PLANT-LOUSE.

THERE are several kinds of these. The two most troublesome to fruit trees are the green and black, small soft insects that appear suddenly in immense quantities on the young shoots of the trees, suck their juices, and consequently arrest thei growth. The Apple, Pear and Cherry, are especially infested with them. They mul tiply with wonderful rapidity. It is said that one individual in five generations might be the progenitor of six thousand millions. Were it not that they are easily destroyed, they would present an obstacle almost insuperable in the propagation and culture of trees.

There are many ways of accomplishing their destruction. Our plan is to prepare a barrel of tobacco juice, by steeping stems for several days until the juice is a dark brown, like strong beer; we then mix this with a solution of soft soap or soap suds. A pail is filled with this, and the ends of the shoots where the insects are assembled are brought down and dipped into the liquid. One dip is enough. Such parts as cannot be dipped are sprinkled liberally. It is applied to the heads of large trees by means of a hand or garden syringe. It should be done in the evening. The liquid may be so strong as to injure the foilage, hence it will be well for persons using it the first time to test it on one or two subjects before applying it extensively. This application must be repeated as often as any of the aphides make their appearance. The dry weather of midsummer is generally the time most favorable for their appearance.

THE WOOLLY APHIS OR AMERICAN BLIGHT.

This is a small insect, covered with a white woolly substance that conceals its body. They infest the Apple tree in particular, both roots

and branches, living upon the sap of the bark, and producing small warts or granulations on it by the punctures. They are more particularly troublesome on old rough-barked trees, as they lodge in the crevices, and are difficult to reach. The wind carries them from one place to another by the light down in which they are enveloped, and thus they spread quickly from one end of a plantation to the other. Not a moment should be lost in destroying the first one that makes its appearance. Where the bark is rough it should be scraped smooth, if the roots be affected the earth should be removed, and every part washed, and every crevice filled with the following preparation, recommended in *Harris's Treatise:* "Two parts of soft soap and eight of water, mixed with lime enough to bring it to the consistency of thick whitewash, to be put on with a brush." A solution of two pounds of potash in seven quarts of water will answer the same purpose. Fresh earth should be put upon the roots.

THE SCALY APHIS OR BARK LOUSE.

This is a dark brown scale insect, that infests the bark of the Apple tree. They are of a dark brown color just like the bark, and not easily seen unless looked for. They attach themselves closely to the bark, and sometimes are so numerous as to form a complete coating. They seldom appear on thrifty growing trees in good soil; but where the soil is damp and cold, and the trees growing feebly, this insect may be looked for. June is the time to destroy them, when they are young. At other times they are hard, and able to resist any ordinary remedy. The same application recommended for the aphis, applied to them with a hard brush, will effect their destruction. Where they have been left for a long time undisturbed, and have pretty well covered the tree, the quickest and best remedy is *to destroy tree and all*, unless it possesses some extraordinary claim for indulgence. Prof. Harris mentions having found a reddish-brown bark louse on his Grape vine, arranged in rows one behind another in the crevices of the bark.

THE APPLE TREE BORER

Is a very troublesome insect in some sections of the country. In Western New York we have never met with it but in two or three instances, in very old, neglected orchards, that had stood for twenty years in grass. The beetle is striped brown and white, and is about three-fourths of an inch long. It deposits its eggs in June, in the bark of the trees near the ground. Here the larva is hatched, becoming a whitish grub, which saws its way into the tree, perforating it in all

directions, sometimes completely girdling it. The most effectual method to destroy them is, to insert the end of a wire into their burrow, and kill them. The same means are taken to guard against them as against the Peach tree grub, viz., placing a mound of ashes around the base of the trunk in the spring, and allowing it to remain until after the season in which the beetles deposit their eggs. It prevents them from reaching the soft bark at the surface of the ground, the place usually selected. It is stated in *Downing's Fruit and Fruit Trees*, that "the beetles may be destroyed in June by building small fires of shavings in different parts of the orchard."

THE APPLE WORM.

The apple moth deposits its eggs in the eye or calyx of the young fruit; the grub is there hatched, and eats its way into the fruit, leaving behind it a brownish powder. Sometimes the Apples drop before they are half grown, and occasionally remain until they acquire a premature ripeness. Early Apples are more affected, generally, than late ones, probably because in a more forward state when the eggs are deposited.

When the fruit falls, the grub immediately leaves, prepares itself a place in some crevice of the bark of the tree, and spins a thin paper-like cocoon, in which it spends the winter, to come out the following spring and reproduce itself. There are but two ways of destroying them; one is, at pruning time in March, to search carefully for the cocoons and destroy them, and the other is to pick up promptly all fallen wormy fruits and destroy them. These two means, industriously followed, will greatly diminish the amount of wormy fruit, the increase of which is exciting alarm.

THE CANKER WORM.

This insect is confined chiefly to New England; we have never seen it in New York.

They generally emerge from the ground in March. According to Professor Harris, some rise during the late autumn and winter months. The female has no wings, but crawls up the tree, and lays her eggs on the branches in May, in clusters of 60 to 100 in each, glued to each other and to the bark by a greyish varnish impervious to water; the little worms fall upon the leaves, and, when numerous, devour them all, leaving only the mid-ribs. They leave the trees when about four weeks old, and descend to the ground. Their effects are most visible in June, when the trees, divested of their foliage, appear as if scorched by fire.

As the female cannot fly, the great point is to prevent her crawling

up; for this purpose various means have been tried and are recommended. One of the most effectual is to tie strips of canvass around the tree and cover it with tar, renewing the tar during their whole season of rising, or from October till May. Another is, to make a close fitting collar of boards around the base of the tree, and keep them covered with tar. Mr. JONATHAN DENNIS, of Portsmouth, Rhode Island, obtained a patent for a circular leaden trough filled with oil, which proves an effectual preventive.

CATERPILLARS.

Of these there are many kinds that are more or less destructive to the foliage of fruit trees; but the Caterpillar, described by Professor HARRIS as the American Tent Caterpillar, is the one that commits such general and extensive devastation in our orchards, and especially in certain seasons. The moth deposits its eggs in July, in large rings, on the branches of the trees; these remain in that state until the following season, when they are hatched in the latter end of May or beginning of June. Each ring produces three or four hundred Caterpillars, and these weave a sort of web to live in. The appearance of a tree with three or four of these tents upon it, and the leaves completely devoured, is really frightful. There are two ways of destroying them; one is, to examine the trees carefully in February or March, at pruning time, and destroy the clusters of eggs by cutting off and burning the branches on which they are found. The next is to destroy the Caterpillars in their tents after they are hatched. There are various ways of doing this, according to people's fancy and ingenuity. The quickest and most effectual method is to take a ladder, ascend the tree, and remove every nest with the hands. The early morning should be chosen, when they are in the nests. Some put a round brush on a pole and put it in the nests, and by giving it a few turns web and all are removed.

THE CHERRY AND PEAR SLUG.

This is a most destructive insect. They appear in June and July for the first, and a second brood afterwards, small, slimy, dark-brown slugs on the upper surfaces of the leaves of the Cherry and Pear. They devour greedily the parenchyma of the leaves, leaving only the bare net-work of veins. In a short time growth is completely stopped.

Stocks for budding require careful watching, for in a day or two these slugs may prevent them from being worked that season. We destroy them by throwing fine earth, taken up with the hand, among the trees, and by ashes or slaked lime, when the earth is not sufficiently dry and fine. The caustic properties of lime and ashes render them more certainly destructive to the slug, and they should always be

used in preference to common earth, where only a few trees are to be gone over.

A liberal syringing with the tobacco and soap liquid recommended for the aphis, but in a weaker state, is serviceable after the ashes and lime. It must be remembered that one application will seldom be sufficient. Some escape even to the third and fourth; but in all cases the warfare should be sustained while one remains. Like the aphis they are generally most troublesome in warm and dry seasons.

THE CURCULIO OR PLUM WEEVIL.

This is a small greyish-brown beetle, nearly a quarter of an inch long; the wing covers form two little humps on the back, which gives it a roundish appearance, and it has a long curved snout, well adapted to its destructive propensities. They can fly, but are not active; and by jarring the part on which they stand, suddenly, they fall to the ground, draw in their legs, and appear dead. It deposits its eggs in a semicircular incision which it makes in the young fruit; it there hatches, eats into the fruit, and causes it to fall while yet green. It is the most troublesome of all insects injurious to fruits. In some places it destroys the entire crop of Plums, Apricots, and Nectarines, and attacks even the Cherry and the Apple. The Peach, even, is not wholly exempt, notwithstanding its coat of down. Almost every remedy that ingenuity can devise has been tried. This whole book would not contain what has been written on the subject in one year alone. Yet no complete, effectual remedy has been discovered. The strongest liquid application of lime, soap, and tobacco—the most powerful and offensive odors, that repel any other insects, are entirely harmless and inoffensive to the Curculio. There seem to be really but two means worthy of being resorted to. One is, to pave, or in some other way harden, the surface of the ground, so that the grubs cannot enter it to complete their transformations. This is found efficient where no other trees are in the immediate vicinity not paved. We have seen many instances where good crops were obtained by this mode. The fact that they are, as a general thing, less troublesome in stiff clay soils than in light porous ones, is alone a proof of the efficacy of a stiff or impenetrable surface soil.

Add to this the picking up of fruit containing the grub as soon as it drops from the tree, and before the worm has a chance to escape.

To accomplish both these ends, some people have planted their Plums and Apricots in a small enclosure by themselves, adjoining the hog-pen, and as soon as the fruit begins to drop, these animals are admitted, and gather all up, and, at the same time, tread the ground so firmly that it is almost as good as if it were paved.

This is probably the easiest and best way to ensure a crop of the fruits attacked by this insect.

Another way is, to jar the tree daily three or four times, from the moment they begin to appear, which is when the fruit is the size of a pea, until they have disappeared, or the fruit begins to ripen, when it is no longer attacked.

Serious injuries have been inflicted on Plum trees, by thoughtlessly striking the bark of the trunk or a large branch with a mallet, to jar the trees. The safer way is to strike on the end of a cut branch, or to fix a cushion of some soft material on the end of a short stick, and place the cushion on the tree, and strike the other end with the mallet. The insects are much easier jarred off in the cool of the morning while they are comparatively torpid.

Before commencing to jar them down, a white sheet or cloth, wide enough to cover all the ground under the branches, should be spread to receive the insects as they fall, so that they may be destroyed. This was recommended through the *Genesee Farmer*, by DAVID THOMAS, twenty years ago.

From repeated observations, we are inclined to believe that it is quite sensitive to cold, for it is well known that in the cool of the morning it is always in a comparative state of torpor; and in the cold seasons of 1849–50, when our Peach trees and fruit were so greatly injured, the Curculio was driven off, and we had a most abundant crop of Plums. A cold day or two may not affect it, but when it continues for two weeks, as in the years referred to, it seems to be rendered powerless for that season. The present season has been remarkably cold, and we have an abundant crop of Plums.

ANTS.

These are not very destructive, yet they sometimes do considerable injury to beds of seedlings, by making their hillocks among them, and they also infest ripe fruits.

Boiling water, oil, or spirits of turpentine, poured on their hillocks, disperses them; and if wide-mouthed bottles, half filled with sweented water or syrup, be hung among the branches of a tree when the fruit is attaining maturity, ants, wasps, flies, and beetles of all sorts that prey greedily upon sweets, will be attracted into them. Dry guano thrown on the hillocks will scatter them.

Mr. DOWNING, who recommends this as a "general extirpator suited to all situations," says, "that an acquaintance caught in this way, in one season, *more than three bushels* of insects of various kinds, and preserved his garden almost entirely against them."

THE PEACH TREE BORER.

This is a most destructive insect when allowed to increase for a few years without molestation. We have seen whole orchards of fine trees ruined by them. They sometimes attack even young trees in the nursery, and commit serious depredations on their collar, rendering them in many cases quite unfit for planting. Their multiplication should be prevented by all possible means. The eggs are deposited in summer on the base of the trunk, near the collar, where the bark is soft. There they are hatched, and bore their way under the bark of the tree, either in the stem or root, or both, producing an effusion of gum. Where trees are already affected, the proper course is, to remove the earth from around the collar of the root, clean away the gum, destroy any cocoons that may be found, trace the grub through its holes in the tree, and kill it; then fill up around the tree with fresh earth, and place a shovelful or two of ashes around the base. One of the best orchards in the vicinity of Rochester was at one time nearly ruined by the prevalence of this grub, when it changed proprietors, and the present one adopted and followed the plan recommended above, until there is not the trace of one left. The ashes or slaked lime should be applied every spring, and at the end of summer may be scattered about the tree. Both ashes and lime form an excellent dressing for the Peach.

THE ROSE BUG.

The eggs of this insect are laid in the earth, where they are hatched, and from which the bug emerges about the Rose season.

In some seasons and in some localities they appear like grasshoppers in vast multitudes, and commit extensive ravages, not only on the Rose but fruit trees, and all other green things. There is no other way known to combat them, but to crush them with the hand — to spread cloths around the trees, and shake them down on it, and kill them. They are stupid, sluggish things, and fall as though they had no life.

In some cases fruit trees have been protected by covering them with millinet.

LEAF ROLLERS.

In May and June these insects may be found on the leaves of fruit trees, and especially on the Pear; they form themselves a sort of cocoon out of the leaf. The leaves attacked by them should be removed and destroyed, in order to prevent their increase. The eggs are deposited on the young leaves by some of the multitudes of spring beetles.

ANIMALS INJURIOUS TO FRUIT TREES.

BIRDS.

AS a general thing, birds are more the friends than the enemies of the garden. Many of them subsist in greater part on insects, and thus perform services that are by no means appreciated. The early Cherries are generally the greatest sufferers by them, and various devices are practiced to frighten them away, the most cruel of which is shooting. Moving objects resembling the human figure, bits of looking-glass or tin suspended among the branches, etc., are often effectual.—Dwarf trees are easily covered with thin netting supported on poles and fastened at the base of the tree.

FIELD MICE.

The most effectual preventive is clean culture. Leave no grass, weeds, rubbish, or heaps of stones around the garden or orchard, and the mice will seldom be troublesome. Their operations of girdling are principally carried on beneath the snow, and when this is firmly trodden as soon as it falls, it obstructs their way. A correspondent of the *Horticulturist* states that he has found tin tubes fixed around the base of the tree, an effectual remedy; and Mr. HOOKER, of Rochester, has successfully driven them off with poison. He takes a block of wood six inches long and three or four square, and bores it lengthwise with an inch and a half auger nearly through, and places in the lower end some corn meal and arsenic. He places these blocks among the trees, mouth inclined downwards, "to keep the powder dry."

MOLES.

These are easily poisoned and driven off, by putting pills of flour mixed with arsenic into their holes, and shutting them up. We have seen them banished by bits of dried codfish placed in the entrance of their holes.

CATS

Often commit serious depredations on trees by scratching the bark. Quite recently we saw a large number of beautiful trees nearly ruined by them. A few briers secured around the trees in the vicinity of the house, where they most frequent, will be a sufficient protection.

HOGS.

It is not generally supposed that these animals will attack trees; but we have heard of a Western farmer who turned in a large number of them to consume the corn that had grown in his young orchard. When the corn began to grow scarce they attacked the trees, and not one out of several hundred but was completely girdled — the bark gnawed off as far up as the brutes could reach.

Where it may desirable to turn Hogs into an orchard, unless the feed be very abundant, the trees should be protected around the base with thorns, briers, or some prickly brush.

DWARF TREES FOR THE GARDEN.

ANY who love the garden, and delight to employ their leisure moments in its cultivation and care, are so situated that they have but a few rods of ground at their disposal. The great question with them is, How can I derive the most pleasure from this small farm? Two or three Apple trees would cover the whole and put an end to all further operations. It is fortunate for all so circumstanced, that a system of dwarfing fruit trees has been devised. By this system the tree is dwarfed, but the fruit retains its usual size, and in many cases its size as well as flavor is improved. The residents of our villages, and those living in the suburbs of cities, with their quarter or eighth of an acre lot, can have a beautiful variety of fruit. In variety they can equal the farmer with his twenty acre orchard. Another advantage is that these dwarf trees bear very early. You may confidently expect your trees to produce fruit the second year after planting. These dwarf trees are remarkably beautiful; nothing in the flower garden or on the lawn can excel them in this respect. Imagine a miniature tree, say four feet high, in the spring all covered with blossoms, and

FIG. 1.

in the autumn the branches loaded to the ground with fruit. Sometimes the Apples on these trees are four times the circumference of the main trunk.

Trees are dwarfed by being budded or engrafted on the root of some small variety.

The APPLE is dwarfed by engrafting on the *Doucain*. By working on the *Paradise* stock it is still more dwarfed, making but a small bush, as in fig. 1.

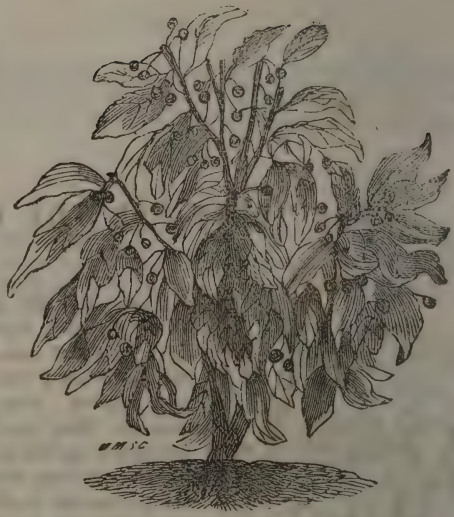


FIG. 2.

Fig. 2 is the portrait of a dwarf *Florence* Cherry tree, given by Mr. RIVERS, of England, in his *Miniature Fruit Garden*, only two years old, and bearing fruit. Except as ornaments, we do not admire the dwarf Cherry. The Cherry on a free stock comes to maturity early enough, and many of the varieties are quite beautiful as shade trees, and are of moderate size.

The PEAR is dwarfed by working on the Quince root. We this year gathered fifty *Rostiezer* Pears from a tree only four years from the bud, and the second year after planting out. Trees of the *White Doyenne* have produced upwards of twenty large specimens the third year from the bud. In the spring of 1853 we bought a *White Doyenne* Pear tree four years from the bud, and planted it the 1st of May. The same season

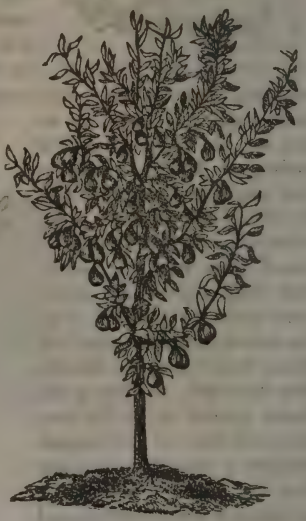


FIG. 3.

it bore sixty-three Pears, fine, large, and beautifully colored. They were exhibited at the fall show of the Genesee Valley Horticultural Society the same season. Fig. 3 is a portrait of a *Louise Bonne de Jersey* Pear, four years old, and never pruned, but allowed to take its own course.

FIG. 4.

Fig. 4 is a portrait of a tree, taken this summer. It is about six years old, and has been well pruned and made to assume the pyramidal form. It is about eight feet high, and five feet wide at the base.

FRUITS RECOMMENDED BY STATE SOCIETIES.

HEN the question is asked—"What are the most popular varieties of fruit under culture in the United States?" we are able to give a satisfactory reply. In giving an answer to this question we depend on the opinion of no individual, but the congregated wisdom of the fruit growers of the country. We have examined all reports that have appeared, and have made out the following list. To each variety we affixed the States in which they have been recommended by fruit committees, and we enumerate those only which have been recommended by at least two States, our object being to make a list of such as have proved successful over a wide area. We believe that as a table of reference it will be found valuable to all who are engaged in fruit culture, or who are collecting information on that subject:

APPLES

American Summer Pearmain—New York, Delaware, Illinois

Baldwin—New York, Delaware, New Jersey, Vermont, New Hampshire, Maine, Ohio, Missouri, Illinois.

Belmont—New York, Michigan, Ohio.

Danver's Winter Sweet—New York, Delaware, Vermont, Massachusetts, Maine, Ohio.

Early Harvest—New York, Pennsylvania, New Jersey, Vermont, New Hampshire, Virginia, Ohio, Missouri, Indiana, Illinois, Delaware, Michigan, Iowa.

Early Strawberry—New York, Pennsylvania, Ohio.

Esopus Spitzenburg—New York, Pennsylvania, Vermont, New Hampshire, Michigan, Ohio, Missouri, Illinois.

Fallenwalden—Pennsylvania, Delaware, Ohio.

Fameuse—New York, New Jersey, Vermont, Mass., Maine, Illinois.

Fall Pippin—New York, Pennsylvania, Delaware, New Jersey, Michigan, Virginia, Ohio, Missouri, Illinois.

Golden Russett—Pennsylvania, New Hampshire, Ohio, Illinois.

Golden Sweet—New York, Maine, Missouri.

Gravenstein—New York, New Jersey, Vermont, New Hampshire, Maine, Ohio.

Holland Pippin—Michigan, Missouri, Indiana.

Hubbardson Nonsuch—New York, New Jersey, Vermont, Massachusetts, Maine.

Jonathan—New York, Ohio, Missouri.

Lady Apple—Delaware, Ohio, Missouri.

Maiden's Blush—New York, Delaware, New Jersey, Ohio, Missouri, Indiana, Illinois.

Newtown Pippin—New York, Delaware, New Jersey, Michigan, Iowa, Virginia, Ohio, Missouri, Indiana, Illinois.

Northern Spy—New York, New Jersey, Vermont, Maine.

Porter—New York, Vermont, New Hampshire, Massachusetts, Maine, Ohio, Missouri.

Rambo—New York, Pennsylvania, Delaware, Michigan, Iowa, Ohio, Missouri, Indiana, Illinois.

Rawle's Janet—Iowa, Virginia, Illinois.

Red Astracan—New York, Vermont, New Hampshire, Maine, Iowa, Ohio, Missouri, Illinois.

Rhode Island Greening—New York, Pennsylvania, New Jersey, Vermont, Maine, Michigan, Iowa, Ohio, Indiana, Illinois.

Roxbury Russet—New York, New Jersey, Vermont, Maine, Michigan, Ohio, Missouri, Indiana, Illinois.

Smokehouse—Pennsylvania, Delaware, Virginia, Indiana.

Summer Queen—New York, Pennsylvania, Michigan, Ohio, Missouri, Indiana, Illinois.

Summer Rose—New York, Pennsylvania, Delaware, New Jersey, Ohio, Missouri, Illinois.

Swaar—New York, Michigan, Ohio, Illinois.

Sweet Bough—New York, Pennsylvania, Vermont, Maine, Illinois, Delaware, New Jersey, Virginia, Missouri, Indiana, N. H., Ohio.

Vandervere—New York, Maine, Missouri, Indiana, Illinois.

White Bellflower—Pennsylvania, Missouri, Illinois.

William's Favorite—New York, New Hampshire, Maine.

Winesap—Pennsylvania, Delaware, New Jersey, Ohio, Illinois.

Yellow Bellflower—New York, Pennsylvania, Delaware, New Jersey, Vermont, Michigan, Iowa, Virginia, Ohio, Missouri, Indiana, Illinois.

PEARS.

Andrews—Connecticut, Vermont, New Jersey, New York, Massachusetts, Georgia.

Bartlett—Connecticut, Vermont, New Jersey, Delaware, Pennsylvania, New York, Maine, Georgia, Iowa, Ohio, Missouri, Indiana.

Beurre Bosc—Connecticut, Vermont, New Jersey, New York, Maine, Indiana, Mississippi.

Beurre Brown—Connecticut, New York, Georgia, Indiana.

Beurre d'Amalis—Connecticut, Delaware, Maine, Georgia, Mississippi.

Beurre d'Anjou—New Jersey, Delaware, Massachusetts, Mississippi.

Beurre d'Aremberg—Connecticut, Vermont, New Jersey, Delaware, New York, Maine, Ohio.

Beurre Diel—Connecticut, New Jersey, New York, Georgia, Ohio, Missouri, Mississippi.

Beurre Goubault—Connecticut, New Jersey, Mississippi.

Beurre Giffard—Connecticut, New Jersey, Pennsylvania, Maine, Indiana, Mississippi.

Bloodgood—Connecticut, Vermont, New Jersey, Delaware, Pennsylvania, Georgia, Ohio, Mississippi.

Brandywine—Delaware, Pennsylvania, Massachusetts, Mississippi.

Buffum—New York, Maine, Massachusetts.

Dearborn's Seedling—Connecticut, Vermont, New Jersey, Delaware, Pennsylvania, New York, Maine, Georgia, Ohio.

Dix—Connecticut, New York, Georgia, Ohio, Mississippi.

Doyenne Boussock—Connecticut, Delaware, Massachusetts.

Doyenné d'Eté—Connecticut, New Jersey, New York, Maine, Massachusetts, Ohio, Indiana, Mississippi.

Doyenne Gris—Pennsylvania, Georgia, Mississippi.

Duchesse d'Angouleme—Connecticut, New Jersey, Delaware, New York, Maine, South Carolina, Georgia, Ohio, Missouri, Indiana, Mississippi.

Duchesse d'Orleans—Connecticut, Delaware, Massachusetts.

Easter Beurre—Connecticut, New Jersey, Delaware, New York, Georgia, Ohio, Indiana.

Elizabeth—Connecticut, New Jersey, Massachusetts.

Flemish Beauty—Connecticut, Vermont, New Jersey, New York, Maine, Georgia, Ohio, Mississippi.

Fondante d'Automne—Connecticut, New Jersey, Pennsylvania, New York, Massachusetts, Georgia, Indiana, Mississippi.

Frederick of Wirtemberg—Connecticut, New York, Maine, Georgia, Ohio.

Fulton—New York, Maine, Massachusetts, South Carolina.

Glout Morceau—Connecticut, Vermont, New Jersey, Delaware, New York, Maine, Georgia, Indiana, Mississippi.

Golden Beurre of Bilboa—Connecticut, New Jersey, Maine, Georgia, Mississippi.

Heathcot—Connecticut, Vermont, Maine, Ohio.

Julienne—Connecticut, Delaware, Pennsylvania, South Carolina, Ohio, Indiana, Mississippi.

Lawrence—New Jersey, Massachusetts, Ohio.

Louise Bonne de Jersey—Connecticut, Vermont, New Jersey, Delaware, Pennsylvania, New York, Maine, Massachusetts, Georgia, Ohio, Indiana, Mississippi.

Madeleine—Connecticut, New Jersey, Delaware, Pennsylvania, New York, Georgia, Ohio, Missouri, Indiana, Mississippi.

Marie Louise—Connecticut, New Jersey, New York, Maine, Georgia, Ohio, Mississippi.

Napoleon—Connecticut, New York, Maine, Ohio, Missouri.

Onondaga—Connecticut, New York, Ohio.

Paradise d'Automne—Connecticut, New York, Massachusetts.

Passe Colmar—Connecticut, New York, Maine, Georgia, Mississippi.

Rostiezer—Vermont, New Jersey, New York, Maine, Massachusetts, Indiana, Mississippi.

St. Ghislain—Connecticut, New Jersey, Penn., Maine, Georga, Ohio.

Seckel—Connecticut, Vermont, New Jersey, Delaware, Pennsylvania, New York, South Carolina, Georgia, Ohio, Missouri, Indiana, Mississippi.

Steven's Genesee—New York, Georgia, Ohio.

Tyson—Connecticut, New Jersey, Pennsylvania, New York, Maine, Massachusetts, Ohio, Mississippi.

Urbaniste—Connecticut, New Jersey, New York, Maine, Massachusetts, Missouri.

Van Mons Leon le Clerc—Connecticut, New York, Georgia.

Vicar of Winkfield—Connecticut, Vermont, New Jersey, Delaware, Massachusetts, Maine, Indiana.

Washington—New Jersey, Delaware, Pennsylvania, Ohio

Winter Nelis—Connecticut, Vermont, New Jersey, Delaware, Pennsylvania, New York, Maine, Georgia, Ohio, Indiana, Mississippi.

White Doyenne—Connecticut, Vermont, New York, Maine, South Caroiina, Georgia, Ohio, Missouri, Mississippi, Pennsylvania, Illinois.

PEACHES.

Cooledge's Favorite—Ohio, New York, Massachusetts.

Crawford's Early—Ohio, Missouri, Georgia, Pennsylvania, New Jersey New York.

Crawford's Late—Ohio, Georgia, Pennsylvania, New Jersey, New York.

Early Ann—Ohio, New York.

Early Newington—Missouri, New Jersey.

Early Tillotson—Ohio, Georgia, New York, New Jersey.

Early York—Ohio, Missouri, Georgia, Pennsylvania, New Jersey New York.

George IV.—Ohio, Georgia, New Jersey, New York.

Grosse Mignone—Ohio, Missouri, Georgia, New York.

Large Early York—New Jersey, New York.

Late Admirable—Ohio, Georgia, Missouri.

Late Heath Cling—Ohio, New Jersey, Kentucky, Missouri, Georgia.

Lemon Cling—Missouri, Georgia, New York.

Malta—Ohio, Georgia.

Morris' Red Rare Ripe—Ohio, Missouri.

Morris' White—Ohio, Missouri, Georgia, Pennsylvania, New Jersey, New York.

New York Rare Ripe—Ohio, New Jersey.

Old Mixon Free—Georgia, New Jersey, New York, Ohio.

Red Cheek Melocoton—New Jersey, New York.

Red Rare Ripe—Ohio, Georgia, New Jersey, New York.

Royal George—Georgia, New York.

Tippecanoe—Georgia, New Jersey.

Troth's Early—Missouri, New Jersey.

Yellow Alberge—Ohio, New York.

Yellow Rare Ripe—Ohio, Pennsylvania, New Jersey.

PLUMS.

Bingham—New Hampshire, Georgia.

Bleecker's Gage—New York, Connecticut, Maine, Ohio.

Coe's Golden Drop—New York, New Jersey, Georgia, Ohio.

Columbia—New York, Maine.

Drap d'Or—New York, New Jersey, Maine, Ohio.

Duane's Purple—New York, Ohio.

Emerald Drop—New York, Connecticut.

Frost Gage—New York, Connecticut, Maine, Georgia.

Green Gage—New York, Connecticut, New Jersey, Delaware, Pennsylvania, Maine, Georgia, Ohio.

Heding's Superb—New York, Georgia, Ohio.

Imperial Gage—New York, Connecticut, Maine, Georgia.

Jefferson—New York, Connecticut, Maine, Georgia, Ohio.

Lawrence's Favorite—New York, Pennsylvania, Maine, Georgia.

Lombard—Connecticut, New Hampshire, Maine.

Purple Gage—New York, Maine.

Reine Claude de Bavay—New York, Maine.

Smith's Orleans—New York, Connecticut, New Hampshire, New Jersey, Maine, Georgia, Ohio.

Washington—New York, Connecticut, New Hampshire, New Jersey, Maine, Georgia, Ohio.

Yellow Gage—New York, Connecticut, New Jersey, Ohio.

Yellow Magnum Bonum—New York, New Hampshire, Connecticut, Maine.

CHERRIES.

American Amber—Michigan, Ohio, Missouri.

Belle de Choisy—New York, Connecticut, New Jersey, Maine, Ohio, Indiana, Massachusetts.

Belle Magnifique—New York, Pennsylvania, Canada West.

Bigarreau (*Yellow Spanish*)—New York, New Jersey, Delaware, Ohio, Missouri, Indiana, New Hampshire, Michigan, Mississippi.

Black Eagle—New York, Connecticut, New Hampshire, Pennsylvania, Maine, Michigan, Ohio, Missouri.

Black Heart—New York, Delaware, Michigan, Ohio, Missouri.

Black Tartarian—New York, Connecticut, New Jersey, Delaware, Canada West, Michigan, Ohio, Missouri, Indiana, Mississippi.

Coe's Transparent—Connecticut, New Jersey, Massachusetts.

Downer's Late—New York, New Hampshire, New Jersey, Maine, Ohio, Mississippi.

Early Purple Guigne—New York, Mississippi, New Jersey, Canada West.

Elton—New York Connecticut, New Jersey, Delaware, Pennsylvania, Maine, Canada West, Michigan, Ohio, Missouri.

English Morello—New York, New Jersey, Delaware, Georgia, Missouri.

Gov. Wood—Massachusetts, Ohio, New York.

Honey Heart—Connecticut, Maine, Massachusetts.

Kentish Morello—Connecticut, Maine, New Jersey, Georgia, Indiana.

Knight's Early Black—New York, New Jersey, Ohio.

May Duke—New York, Connecticut, New Hampshire, New Jersey, Delaware, Maine, Michigan, Georgia, Ohio, Indiana, Mississippi.

Napoleon Bigarreau—New York, Connecticut, Michigan, Ohio, Missouri, Mississippi,

White Bigarreau—New York, Connecticut, New Hampshire, Delaware, Michigan, Ohio, Mississippi.

APRICOTS.

Breda—Ohio, Mississippi, Georgia, New Jersey, New York.
Large Early—Ohio, Mississippi, New York.
Moorpark—Ohio, Mississippi, Georgia, New Jersey, New York.
Peach—Ohio, Mississippi, Georgia, New Jersey.

NECTARINES.

Early Violet—Ohio, New Jersey, Massachusetts, New York.
Elruge—Ohio, New Jersey, Massachusetts, New York

QUINCES.

Orange Apple—Ohio, New Jersey, New York.
Portugal—Ohio New Jersey.

HARDY GRAPES, FOR OUT-DOOR CULTURE.

Catawba—Ohio, Missouri, Iowa, Georgia, Canada West, Massachusetts, Delaware, New Jersey, Connecticut.
Clinton—Michigan, Canada West.
Elsinboro—Delaware, New Jersey.
Isabella—Ohio, Missouri, Iowa, Georgia, Michigan, Canada West, Massachusetts Delaware, New Jersey, Vermont, Connecticut.

CURRANTS.

Black Naples—New Jersey, Massachusetts, Canada West.
Knight's Sweet Red—New York, New Jersey.
May's Victoria—Massachusetts, New York, Canada West.
Red Dutch—New York, Delaware, Massachusetts, Canada West, Missouri, Ohio.
White Grape—New York, Canada West.
White Dutch—New York, New Jersey, Delaware, Massachusetts, Canada West, Missouri, Ohio.

RASPBERRIES.

Fastolff—New York, Connecticut, New Jersey, Maine, Massachusetts, Mississippi, Ohio.
Franconia—New York, Connecticut, Vermont, New Jersey, Maine, Massachusetts.

Knevett's Giant—New York, Connecticut, Maine, Massachusetts, Ohio.

Red Antwerp—New York, Connecticut, New Jersey, Canada West, Mississippi, Ohio.

White (*or Yellow*) *Antwerp*—New York, Canada West, New Jersey, Massachusetts.

STRAWBERRIES.

Black Prince—Mississippi, Canada West, New York.

Boston Pine—Indiana, Maine, Connecticut, New York.

Burr's New Pine—Ohio, Missouri, Canada West, New York.

Hovey's Seedling—Ohio, Mississippi, Indiana, Missouri, Canada West, Massachusetts, Maine, Delaware, New Jersey, Connecticut, New York,

Hudson—Ohio, Canada West, New York.

Iowa—Ohio, Missouri.

Jenney's Seedling—Ohio, Maine, Connecticut, New York.

Large Early Scarlet—Mississippi, Missouri, Canada West, New York, Massachusetts, Maine, Delaware.

McAvoy's Superior—Ohio, Indiana.

FRUITS RECOMMENDED BY THE AMERICAN POMOLOGICAL SOCIETY.

FOR GENERAL CULTIVATION.

APPLES.

American Summer Pearmain,
Baldwin,
Bullock's Pippin,
Danver's Winter Sweet,
Early Harvest,
Early Strawberry,
Fall Pippin,
Fameuse,
Gravenstein,
Hubbardston Nonsuch,
Lady Apple,
Ladies' Sweet,
Large Yellow Bough,
Melon,
Minister,
Porter,
Red Astrachan,
Rhode Island Greening,
Roxbury Russet,
Summer Rose,
Swaar,
Vandervere,
White Seek-no-Further,
William's Favorite (except for light soils),
Wine Apple, (or Hays,)
Winesap.

PEARS.

Ananas d'Eté,
Andrews,
Belle Lucrative, or Fondante d'Automne,
Beurré d'Anjou,
Beurré d'Aremberg,
Beurré Diel,
Beurre Bosc,
Bloodgood,
Buffum,
Dearborn's Seedling,
Doyenné d' Eté,
Flemish Beauty,
Fulton,
Golden Beurre of Bilboa,
Lawrence,
Louise Bonne de Jersey,
Madeleine,
Manning's Elizabeth,
Paradise d'Automne,
Rostiezer,
Seckel,
Tyson,
Urbaniste,

Uvedale's St. Germain, (for baking),
Vicar of Winkfield,
William's Bon Chretien, or Bartlett,
Winter Nelis.

PEARS — FOR CULTIVATION ON QUINCE STOCKS.

Belle Lucrative,
Beurré d'Amalis,
Beurré d'Anjou,
Beurré d'Aremberg,
Beurré Diel,
Catillac,
Duchesse d'Angoulême,
Easter Beurré,
Figue d'Alençon,
Glout Morceau,
Long Green of Cox,
Louise Bonne de Jersey,
Napoleon,
Nouveau Poiteau,
Rostiezer,
Beurré Langlier,
Soldat Laboreur,
St. Michael Archange,
Triomphe de Jodoigne,
Urbaniste,
Uvedale's St. Germain, or Belle Angevine, (for baking,)
Vicar of Winkfield,
White Doyenné.

PLUMS.

Bleecker's Gage,
Coe's Golden Drop,
Frost Gage,
Green Gage,
Jefferson,
Lawrence's Favorite,
McLaughlin,
Purple Gage,
Purple Favorite,
Reine Claude de Bavay,
Smith's Orleans,
Washington.

CHERRIES.

Belle Magnifique,
Black Eagle,
Black Tartarian,
Downer's Late,
Downtown.
Elton,
Early Richmond, (for cooking,)
Graffion, or Bigarreau,
Knight's Early Black,
May Duke.

APRICOTS.

Breda, Large Early, Moorpark.

NECTARINES.

Downtown, Early Violet, Elruge.

PEACHES.

Bergen s Yellow,
Cooledge's Favorite,
Crawford's Late,
Early York, *serrated*,

Early York, large,
George IV.,
Grosse Mignonne,
Morris White,
Old Mixon Free.

GRAPES — UNDER GLASS.

Black Hamburg,
Black Frontignan,
Black Prince,
Chasselas de Fontainebleau,
Grizzly Frontignan,
White Frontignan,
White Muscat of Alexandria.

GRAPES — OPEN CULTURE.

Catawba, Diana, Isabella.

RASPBERRIES.

Fastolff,
Franconia,
Knevett's Giant,
Red Antwerp,
Yellow Antwerp.

STRAWBERRIES.

Boston Pine,
Hovey's Seedling,
Large Early Scarlet,

NEW VARIETIES WHICH PROMISE WELL.

APPLES.

Autumn Bough,
Benoni,
Coggswell,
Genesee Chief,
Hawley,
Jeffries,
Ladies' Winter Sweet,
Monmouth Pippin,
Mother,
Primate,
Smoke House,
Winthrop Greening, or Lincoln Pippin.

PEARS.

Adams,
Alpha,
Beurre Clairgeau,
Beurre Giffard,
Beurre St. Nicholas,
Beurre Sterkman,
Beurre Superfin,
Brande's St. Germain,
Brandywine,
Chancellor,
Charles Van Hooghten,
Collins,
Comte de Flanders,
Doyenne Boussock,

Doyenne Goubault,
Duchesse de Berri,
Duchesse d'Orleans,
Epine Dumas,
Fondante de Malines,
Fondante de Noel,
Howell,
Jalousie de Fontenay Vendee,
Kingessing,
Kirtland,
Limon,
Lodge [of Penn],
Nouveau Poiteau,
Onondaga,
Ott,
Pius IX.,
Pratt,
Rouselette d'Esperin,
Sheldon,
St. Michael Archange,
Steven's Genesee,
Striped Madeleine,
Theodore Van Mons,
Van Assene, or Van Assche,
Walker,
Zepherine Gregoire.

CURRANTS.

Black Naples,
May's Victoria,
Red Dutch,
White Dutch,
White Grape.

GOOSEBERRIES.

Crown Bob,
Early Sulphur,
Green Gage,
Green Walnut,
Houghton's Seedling,
Iron Monger,
Laurel,
Red Champagne,
Warrington,
Woodward's White Smith.

BLACKBERRIES.

Lawton's New Rochelle.

PLUMS.

Ive's Washington Seedling,
Munroe Egg,
Prince's Yellow Gage,
River's Favorite,
St. Martin's Quetche.

CHERRIES.

American Amber,
Belle d'Orleans,
Bigarreau Montrose de Bavay,
Black Hawk,
Coe's Transparent,
Early Purple Guigne,
Governor Wood,
Great Bigarreau of Downing,
Hevey,
Kirtland's Mary,
Ohio's Beauty,
Reine Hortense,
Walsh's Seedling,

GRAPES.

Concord.

RASPBERRIES.

French, Orange, Walker

STRAWBERRIES.

Walker's Seedling.

FOR PARTICULAR LOCALITIES.

APPLES.

Canada Red, Newtown Pippin,
Esopus Spitzenburg, Northern Spy,
Yellow Bellflower.

PEARS.

Gray Doyenne, White Doyenne.

PEACHES.

Heath Cling.

PLUMS.

Imperial Gage.

STRAWBERRIES.

Burr's New Pine, Jenney's Seedling.

FOR NORTHERN LOCALITIES.

APPLES.

Ribstone Pippin.

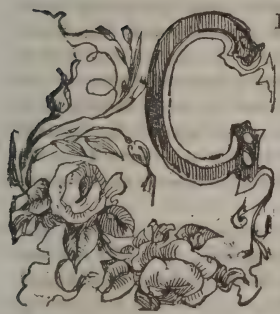
FOR GARDENS

APPLES.

Garden Royal.

The Vineyard.

CULTIVATION OF THE GRAPE.



RAPE-CULTURE in the Vineyard is now receiving so much attention, and information is so eagerly sought, that we determined to devote a chapter to the subject. Perhaps no subject connected with Fruit Culture is so little understood in this country as the culture of the vine. The vine is a native of our country, it prospers with ordinary care, and no fruit more richly repays for the labor bestowed upon it. Then the fruit can be so easily saved for winter use, that we would urge all who are favored even with a rod of earth, to cultivate the vine.

SOIL AND POSITION.

Some diversity of opinion exists among those who plant the vine, as to the most favorable exposure — each has his peculiar notions, often founded upon preconceived views brought from a distant country, not similarly situated, and with a different climatic constitution from our own, or drawn from the dogmas and experiences of writers and planters in other lands. From these various views, preconceived and practical, I shall endeavor to deduce some data, which are the results of a very extended series of observations made in hundreds of localities, with every variety of exposure.

Low lands, river bottoms and valleys, should generally be avoided, as unsuited, on many accounts, for Grape-culture; chiefly for the

following reasons: they are very subject to late vernal frosts, which are often disastrous to the tender young shoots of the vine; they are also obnoxious to early frosts in the autumn, unless where protected by fogs; they do not enjoy so free a circulation of air as is desirable for the vine; the soil is apt to be too rich in vegetable matter, and, if not underlaid by gravel, the subjacent moisture will be injurious. The early vine-planters at Vevay, Indiana, committed this mistake, and were soon driven to the hill-sides, or discouraged, and relinquished the culture to such an extent that the products of that whole region is now quite insignificant.

Hill-sides are generally preferred, and the majority select those with a southern exposure — those sloping eastwardly to meet the early sunshine, and those with a western declivity, to receive the health-giving zephyrs, are also much preferred by some close observers, who claim for either circumstance, quite as much value as for the full meridian rays of our summer sun, while others consider a northern slope still more advantageous, because of the greater immunity from the spring frosts, where the buds are not forced so early as in more sunny situations. These hill-sides are generally so precipitous as to render benching or terracing necessary, and where the horizantal layers of limestone are freely mixed with the soil, these stones are used for the construction of walls, to support the earth of the terraces; when absent, the benches are constructed of the turf or sods, and they are preserved by the growth of the grass. The presence of small loose stones is much valued by some vignerons.

Hill-tops, on account of their elevation and free exposure to sun, and especially to the stirring breeze, are, in my opinion, decidedly the best positions for the vineyard. Here we have much less liability to vernal frosts — perfect exposure to the sun and air, for the dissipation of too abundant moisture, and an almost complete immunity from fogs, which may be very valuable to protect the deeper valleys from a late frost, but which are exceedingly injurious to the swelling Grape, in the heats of June, the most critical period with this fruit. Upon these hill tops we often find abundant natural drainage, and a soil of peculiar excellence and adaptation to the vine — a deep, rich, sandy or friable loam, with clay enough in its composition to give it a proper tenacity, but not enough to render it heavy, — and indicating a richly varied list of constituents. In such a soil, found especially upon the ridges of our river hills, there is a smaller portion of lime, and a larger amount of organic matter; in this the Grape is found to flourish remarkably.

I shall, therefore, conclude by recommending an elevated position, well exposed to both sun and wind, and a rich, friable soil, of varied ingredients, rather than the stiff limestone clays of the hill-sides.

PREPARATION OF THE SOIL.

Having determined upon the soil and position that promise to be best adapted to the vineyard, the next step will be the preparation of the land. Should the subsoil be tenacious, clayey, and holding water, even in a small degree, it will be advisable to lay drains, but if it should happen that the ground be at all spouty, it will be absolutely necessary to under-drain thoroughly, otherwise it will be a loss of labor to prepare the soil in the usual way, and a loss of plants to set them out upon it; for the Grape is as fastidious of a wet foot, and as easily affected as the most delicate invalid.

Of the importance of drainage, as a means of meliorating the soil, most persons are not sufficiently aware — none but those who have witnessed the good effects of this process can properly appreciate its great benefits; for it has been well and truly said, that by draining, the soil is kept from being too wet, and also preserved from the effects of drouth — that it is warmed by the summer showers, and escapes the chilling influence of excessive moisture, and is kept from being baked by excessive heat — that it is percolated by currents of the all-pervading air, laden with treasures of food for the plants, while at the same time the cutting blasts of winds pass harmlessly over it without drying out all of the moisture, and producing excessive cold by its evaporation.

This primary object having been effected, the next step is to prepare the soil for the noble crop which it is expected to sustain. This being a work destined to last for a life-time, it is all-important that it be well performed. If the vineyard be expected to yield profitable returns, there should be no niggardly expenditure in the arrangement, but the most thorough preparation of the soil is to be effected. The best method of doing this is to trench the land with the spade, digging it two or three feet deep, or as much more as you choose; it has been asserted by some that if the soil were stirred to the depth of ten feet, the crop would be all the better for the operation, and the vines would continue to yield profitably for a longer period.

Plowing. — Some persons, especially those who have selected a level position, or the summit of a ridge which is nearly level, will feel unwilling or unable to incur the great expense of trenching a large vineyard, at a cost of fifty dollars per acre. Though not generally recommended, plowing may be substituted for spade husbandry, if care be taken to have it very thoroughly done, and, with the aid of modern improved implements, this may be executed with considerable effectiveness. The largest sized plow, drawn by a powerful team, is used to reverse the surface soil to a depth of one foot; the Michigan double plow may be found better suited to this work than any other, because

it may be made to turn a narrower furrow-slice, and at the same time open a deep trench, and thus the work can be adapted to the strength of the team. The next process will be to loosen the deeper earth thoroughly with a subsoil plow drawn by a powerful team, and kept down to its full depth, so as to stir up the soil for a foot or more, leaving it broken but not excavated. If it be desired, a plow with a peculiar mold-board, or the Michigan plow itself, is then introduced, and the loosened earth thrown out upon the furrow left by the breaking-plow first used. The subsoil plow is then again passed along the furrow. This will require two or three teams and as many plowmen, but will effect the object, of stirring the soil pretty effectually, for the depth of twenty to thirty inches.

Some very fair vineyards may be found that have never been trenched and only prepared with the plow: but the practice is not sustained by the best vignerons, and apprehensions are entertained that such superficial preparation will not be followed by enduring vines; many of the vineyards of Europe, however, have had no better preparation.

Another method prevails among a portion of the German vine-dressers — it is called the bed or ridge system, and is adapted only to level land, or to gentle slopes. It consists of the construction of ridges about a rod in width, well trenched, and having wide gutters left open between them; the chief advantages appear to be thorough surface drainage and deeper tilth.

LAYING OFF — PLANTING.

After the ground has been thoroughly prepared, as previously advised, whether by the plow or the spade, an important and rather nice operation is to be performed before proceeding to plant the vines; this is called *laying off* the vineyard, and should be done with some degree of accuracy, since much of the appearance and snugness of finish of the place, will depend upon the correctness with which this is effected. A sufficient number of little sticks should be prepared; these are best made by sawing a straight inch pine board, into lengths of a foot or fifteen inches; these pieces are then to be split, and pointed, so as to enter the ground easily.

In the spring, these are taken to the field, and used to mark the spot where the vines are to grow, and there they remain during the first season, to aid the vine-dresser in finding the young tender thing, which is often very inconspicuous at first, though eventually destined to become a great vine. The distance at which these sticks are to be placed, will depend much upon the nature of the ground, its exposure, and also upon the manner in which it has been prepared, whether it be

in benches or otherwise. The rows may be set closer on narrow terraces than on wider levels, because of the more open exposure of the former.

Different views exist among planters, as to the proper spacing, and certainly different distances should be allowed for rampant and for slender growing varieties of the vine. Having stretched a line along one side of the space to be planted, a measuring stick is prepared, of the length determined, and with this the little sticks are set with accuracy, at the proper distances; the line is next moved to the width of the rows, and the same measuring stick is again used, in setting the stakes; great accuracy is required in these first two settings, because they will be used as guides to prove the remainder, so long as they remain in sight.

The very common distance, in most vineyards, is four feet each way, for the *Catawba* and other Grapes most cultivated, but the *Herbemont*, and some others, require more space, while the *Missouri* would answer equally well, as it grows here, if crowded more closely. The vine-sticks are often set 3½ by 4 feet, and 4 by 4, or 4 by 4½, occasionally wider, say 3 by 5, or even 3 by 6. Mr. BUCHANAN recommends, for steep hillsides, 3½ by 4½, or 3 by 5, but for gentle slopes, 3½ by 6, he says, is close enough, and for level land, 4 by 7, which will admit sun and air to mature the fruit, and leave space enough for the roots: he refers, of course, to the vigorous, native sorts, chiefly cultivated, and which are remarkable for their long, healthy canes, and exuberant foliage.

The number of plants wanted per acre, will depend upon the distance chosen; 3½ by 4 feet, will require 3,112 vines; 4 by 4, 2,762; 4 by 4½, 2,420; 3 by 5, 2,904; 3½ by 4½, 2,766; 3½ by 6, 2,075; 4 by 7, 1,556; 3 by 8,2,815; 6 by 8, 908. If cuttings be planted, double these numbers will be required.

PLANTING. — After the ground has been properly laid off, the next proceedure is planting the slips, or vines, which ever may have been determined upon. There are advocates for both plans, and there may be reasons why one or the other should be preferred for different localities, and under different circumstances, depending upon the distance the young plants have to be carried, and the convenience of transportation. In some attempts which were made in Arkansas, owing to the irregularities in the navigation, and perhaps, also, a want of sufficient care in packing, the young vines nearly all died before reaching their destination—in such a case, the cuttings would, probably, succeed much better. Young plants are always to be preferred to old ones, and many prefer even to set out the cuttings, where they are to stand, and thus avoid the difficulty of transplanting altogether, nor incur the check and risk of removal. Tender as it is, however, the yearling vine, with its slender rootlets, will suffer less in transplanting, than an

old vine; indeed, an experienced vigneron will hardly accept such as a gift, preferring rather to wait until healthy young plants shall develop themselves, in the places where they are to stand.

If rooted plants are used, whether yearlings, or two-year old vines, holes should be dug in the trenched land, after it has become quite warm and dry, in the spring, say in April; these holes should be made beside the sticks set out at the laying off—and they must be large enough to accommodate all the roots of the young plants, without crowding; one foot by eighteen inches will generally be sufficient, and a foot deep. Few of the plants should be exposed at once, and they must be wrapped up in a damp cloth, to prevent them from drying; the vine should then be placed in the hole, and the roots carefully spread out, so as to come into a natural position, the stem being inclined to the stick at one side of the hole, and brought to the general level of the ground; the best loose earth is filled in among the roots carefully, and a cavity is left above them to retain moisture until towards midsummer, when it is filled.

The plan of making a vineyard from the cuttings set out in the field, is now obtaining many advocates among our most intelligent cultivators, although it is ranked among the innovations of modern practices. The holes are dug the width of the spade, and extending a foot or eighteen inches beyond it, on either side, in the direction of the rows. Two cuttings, duly prepared, are set in each hole, bent somewhat as seen in the cut, (figures 1 and 2,) and inclined so that their upper ends or points shall come together, or cross one another, near the stick, beside the hole.—

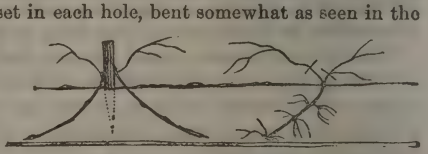


Fig. 1. Fig. 2.

These points are brought up to the level of the earth, and the best and most mellow soil filled in, and pressed gently against them with the foot, the points being covered about an inch.

TREATMENT.

The young vines will need very little attention during the first season — the ground should be lightly hoed about the plants, and all weeds are to be promptly destroyed; every twig and every leaf should be left undisturbed, because of the important functions, that of forming roots, which devolve upon the new plant, which is now setting up an independent establishment for itself, and must, in future, depend upon its own resources. Should both these cuttings grow, in the vineyard stations, one of them must be removed in the autumn, either by cutting

it off below the surface with a sharp knife, or by digging it up carefully; in order to appropriate it to some vacancy that may have occurred in the plantation, for new plantings, or for sale.

PRUNING AND TRAINING.

A considerable difference of opinion prevails among our vignerons, as to the proper time for winter pruning; some persons urge the performance of this operation just before the sap starts in the spring; others advise it to be done in the autumn, after the wood has fully ripened; while others recommend that it be performed during any *fine* weather through the winter. All, however, agree that it should *not be done* when the wood is frozen.

As a good deal of tact and judgment are necessary in this process, general rules can only be laid down, and every one must be guided by his own discretion. In trimming the vineyard, the first thing is to loosen the vine from the stakes, by cutting the old ties. Supposing that the stakes have been set in the vineyard, and the vines are of bearing age, they must be pruned according to the soil and the strength of the wood, and this will require the strength of the exercise of good judgment; if feeble, cut back the lowest branch very close, and remove all others, and thus endeavor to secure strong shoots for the next year, but of course you must expect few or no bunches of Grapes; if strong and healthy, select the largest and stoutest shoot, coming out as low down on the stock as may be, trim off all lateral and old tendrils neatly, and cut it off at six, eight or ten eyes or buds above its origin; be sure not to leave a joint too much, as the results of over-bearing are very injurious to the vine, and indeed seldom furnish well-ripened berries.

The lowest and next best shoot is then to be selected for the *spur*, and it should be as low as possible; cut it back two or three eyes, which are to furnish the canes for the next year; let the old wood of the last year's crop, and all extraneous shoots, be then cut off smoothly and close to the stock. See figures 3 and 4, which represent the trimmed vine.

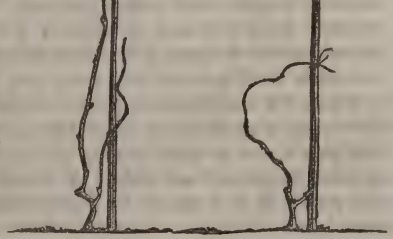


FIG. 3. FIG. 4.

These directions are brief and concise, but as before observed, great

judgment is required, or the stock will become too long, as is represented in figure 9, where the summer pruning has been neglected the previous season. Better lose the crop now on any vine, than incur the risk of losing two or three crops by allowing the vine to become too high, which will require it to be cut back to the ground, or layered, before it can be again restored to a good shape.

These wood-cuts represent vines that have been winter-pruned as before directed. In figure 3 the canes have been freed from the stake, and all tendrils and laterals have been removed, and they have been shortened-in, but the weaker of the two has not been cut off for the spur. In figure 4, the spur is cut to its proper length, and the cane has been bent and tied in the form of the bow, the use of which is well understood by the vine-dresser, but may require an explanation here. The object is to cause the buds to break evenly, by equalizing the force of the sap.

These figures are given to illustrate the winter-pruning, and its dependence upon judicious summer-pruning of the previous summer. Figure 5 shows a bow of the previous year, which had been properly subordinated, by judicious pinching-in of the fruit-bearing shoots, so that the whole wood-making force of the plant was directed to the two canes that issued from the spur; these are represented as being strong and vigorous, and devoid of lateral shoots. The straight line drawn across the base of the bow, is intended to indicate the point at which it is to be cut off, for upon the renewal system, adopted generally in our vineyards, the fruit-bearing wood is annually removed and as often renewed. Of the two canes, one is to be cut short for a spur, and the other of a suitable length to make a bow, as represented in figure 6, where, however, the drawing indicates that too much wood has been left in the bow, unless the root be very strong.

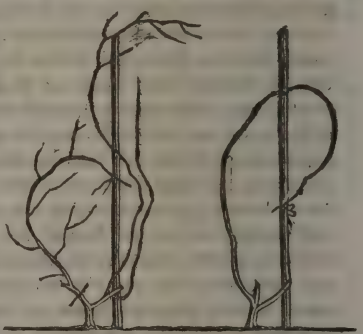


FIG. 5. FIG. 6.

Figure 7 is intended to represent another form, called the double-bow; it is a copy of an European method frequently adopted with strong vines; this plan is not so often seen as the single bow, and it is not recommended for general use; indeed, it should only be permitted in strong old stocks, as it is almost inevitably followed by two great a show of fruit.

Figures 8, 9, and 10, are given to show the result of neglect in the summer-pruning, and the mode of correcting the difficulty when trimming

in the winter, if the vine be strong and the owner is unwilling to lose the season by cutting back the stock to force out new and strong canes for future use. These cuts are intended to be representations of the same vine. 8 shows that the buds at the top of the bow had been allowed to retain the mastery in their shoots, which arose from their superior situation, they being forced into top buds, and as their excessive growth was not properly checked, they grew strongly at the expense of the other branches, and especially to the detriment of the canes that should have been produced from the spur. Such a vine is very frequently met with in the winter-pruning, for few persons realize the importance of early attention to the process of pinching-in, which is recommended in this paper to give especial care.

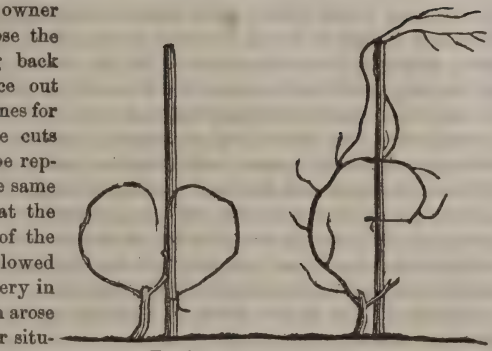


FIG. 7. FIG. 8.

Two plans may be pursued, as represented in figures 9 and 10; in the first, all the laterals are trimmed in to a single eye, and a portion of the strong shoot is retained as a new cane, making a combination of cane and spur, and the whole is used to construct the new bow, and bent so as to bring it within proper limits; the old spur is also cut in boldly, and great care is exercised to encourage vigorous renewal shoots or canes, for future use as bows the next season. The other plan is, at once to give up the renewal system for a while, and adopt the spur method; this may sometimes be found most advisable. In adopting it, the old bow is retained, and the side branches are cut back every year to a single eye. The objections to the system are, that it requires great watchfulness and care to preserve an equable vitality in the shoots, so that the foliage and fruit may be spread evenly; and besides this, the old wood is not generally so well adapted to the production of fruit

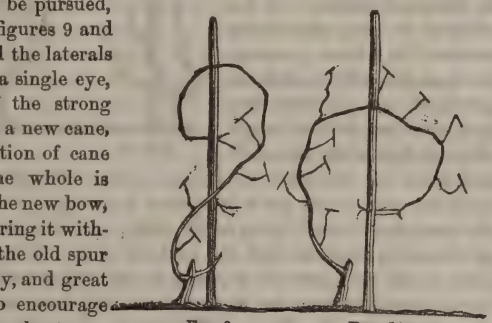


FIG. 9. FIG. 10.

the vigorous young canes; then, again, it is necessary to lose a season whenever it may be found necessary to reproduce the bow, or main shoot as it would here be considered, for the bow or horizontal system of training should still be adopted. It should be recollected that these directions are particularly applicable to the vineyard culture of the *Catawba* Grape to which they are known, by long experience, to be adapted. Different plants, with various habits, often require very different treatment and pruning. We have already discovered that the *Isabella* grape does not succeed well, as a general rule, under the treatment here advised; so, also, with the *Herbemont*, and some other very rampant growers, it has been observed that they need long pruning to realize their greatest excellence and heaviest crops.

Figures 11 and 12 are given to illustrate quite another style of pruning, which is sometimes called the distaff or bush method. This is perhaps the most difficult of all, and requires the greatest exercise of good clear judgment in its management, and is, consequently, very seldom met with in vineyard culture. 11 is a view of the vine after it has received its winter pruning; the bush of nearly equal shoots produced the previous summer, has been thinned out to three or four of the strongest,

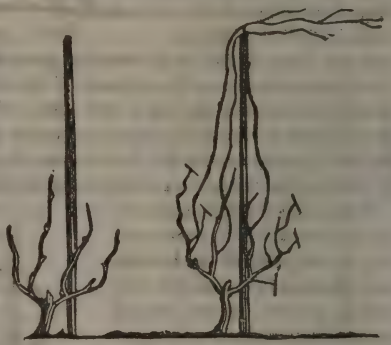


FIG. 11. FIG. 12.

and these are cut back, according to their strength, to two, three, or even six eyes, which gives the plant a sturdy appearance, and avoids the necessity of much tying to the stake. During the ensuing summer, great care is requisite, and the exercise of good judgment is called into play, in the management of young shoots, which will be almost sure to spring strongest from the highest buds, and thus speedily make confusion in the distaff. These will need to be curbed and the lowest branches encouraged and tied to the stake for support — figure 12. By a proper management of this style of pruning, a good supply of leaves is secured, and an abundant crop of well-ripened and well-distributed fruit; but the necessary care and treatment are so difficult to describe, and depend in each case so entirely upon the judgment of the operator, that it is almost impossible to instruct a common workman in the details, and the too frequent result will be a tall, straggling bush of naked and unproductive branches, with a constant tendency to extension upward, instead of the snug and tidy appearance of well grown bow and spur

pruning, which is remarkable for its simplicity, and may be understood by all who have once seen it properly performed.

Training and Tying of the vines is an important operation, and should be performed at the end of March or the beginning of April. After trimming, the canes are to be securely tied to the stakes, which should have been firmly driven in the ground before it settles too closely. The usual method is to bring the main stock against the stake, and secure it with an osier; the bow or hoop is then bent and tied where it passes the stake above, and if long enough, it should be brought back toward the stock, and there secured. Some train horizontally, whether on trellises, wires, or by simply tying the ends of the canes to the adjoining stake. It should also be observed, that a damp or wet day must be selected for this process, because the strain upon the branch even in careful hands, will otherwise endanger the vines breaking where it is bent, and an experienced vigneron will give the cane a very gentle twist as he is bending it, and thus avoid the accident apprehended. Various modifications of training might be suggested, but these are left for the genius of each to suggest as he progresses in the work; security is the great desideratum, and is best attained by good tough willows.

The young shoots are rich in promise of fruit for this year, and wood for the next; therefore the vine-dresser should be especially jealous of everp intrusion, and provident against all injuries. To this end he must exclude all boys and dogs from the grounds, but he will frequently pass through the vines with the wisp of damp rye straw, cut into lengths of about twenty inches, and as fast as the shoots grow, he will tie them up to the stakes. This operation should be repeated every week or two; for the union of the new and old wood is so feeble at this stage of growth, that the least force will rupture the connection, and sacrifice the rich prospect. He will, therefore, constantly watch the protruding shoots, and secure them with straw bands, which, like the osiers, are really twisted rather than tied.

During July, the long canes for next year will require to be trained from one stake to another. In this process, the advantage of closer planting in wider rows, say six feet apart, by three in the row, will be apparent. The trellis, particularly that made of stout wire, will also be very convenient in attending to this duty, as the canes need only be laid along the top wire or rail of the trellis, with a little twist to sustain them until the clasping tendrils may secure their firm embrace. The fruit branches will also sometimes require support, as their burden increases in weight; though it is no disadvantage to the branches to let them lie even upon the ground. The rot is seldom found in fruit so situated, and it has been observed that such are often the earliest ripened bunches, which may depend upon the greater warmth at the surface sheltered by leaves.

RUBBING OUT AND PINCHING.

The vigor of many of our native vines forces out an exuberant growth of the buds; three or more often break out from each joint. As this would diffuse and weaken the growth, all but one, the strongest, should be rubbed off with the finger before they exhaust the vine too much. This should, therefore, be done so soon as the promise of fruit is sufficiently developed to be a guide in thinning the shoots. It will very soon be discovered that the topmost eyes or buds, having started earlier than the others, and receiving the greatest flow of sap, will be taking the lead, at the expense of their followers, as represented in fig. 8. On account of the difficulty in winter pruning, this must not be allowed, and is to be counteracted by early pinching off their points; but this must not be done too closely, for it is necessary always to leave at least two or three of the young leaves beyond the last bunch of grape-buds, or "seed," as they are called by the vignerons; many persons advise leaving four or more leaves. At the same time, these, and all the shoots that are growing freely, should be tied to the stake with dampened rye straw, as already advised, to secure them from injury by wind, as they are very easily torn away from the stock.

If the wire trellis should be used, no ties will be necessary but those provided by nature in the vine itself; the young branch is gently turned around a wire in such a way that its own elasticity preserves its position until the tendril has time to clasp the wire. Another plan is occasionally adopted, to save a long shoot, when the vine-dresser does not happen to be provided with suitable ties; it is, to cut an oblique slit on one corner of the stake, and insert the tendril, which thus secures the vine very well; but this practice is not recommended except as a substitute for the straw band, and to be used in an emergency, for the vigneron should ever have watchful eyes, and must secure the young straggler, whether he be provided with ties or only his knife.

If the tender-hearted, or those who were anticipating hail-storms and other injuries, failed to attend to the duty of thinning-out the superabundant shoots during May, let them see to their vines, ere the whole force of the season shall have been diffused among a great number of weak shoots, or for want of guidance and direction, some of them shall have taken a lead in the wrong direction. As may have been inferred from the remarks upon winter pruning, this summer treatment of pinching is a very important matter; and much of the future success will depend upon judicious management of the vines in this particular. At the first examination of the vineyard, before the blossoming, rub out all weak shoots, and such as have no "seed" or prospect of fruit; also, remove the weaker, where duplicates appear; but observe specially to

provide thrifty wood for the next season, and so arrange your summer pruning that two good shoots shall grow out from the lower part of the bow and stocks; and endeavor to have these well balanced, one on either side. If, from any accident, your bow-shoots are deficient, or if the stock, from previous neglect, have become too tall, now will be a good time to select the strongest shoot among those commonly called winter sprouts, which often come out from near the ground, and which should otherwise be entirely removed; this may be grown and encouraged for forming the *spur* in next winter's pruning. This method has been adopted with the happiest effect in an old vineyard, where, from neglect, the stocks had become tall, crooked, and ugly; and the result, at the end of a couple of years, has been an entire renewal of the vines, the old stems having been cut off below the surface.

Pinching-in is recommended for May, but must be continued through the season. If this process has been neglected before, or more especially if it has been too severely practiced, the greater care will be necessary afterward, as in the latter case, the force of the vine will be throwing out laterals, to make up for the shortening at the points. This is a waste and misdirection of the strength, and may also be followed by injury to the vines. Do not, however, be too severe in your treatment of these laterals, and by no means break them out, as has been recommended by some. Shorten them into one or two leaves, rather than to tear them out; the growing fruit needs shade and healthy leaves to elaborate the sap, and if the first crop of laterals be destroyed, the dormant bud will often be forced to start.

On the canes it has been advised to remove all laterals from the length of the wood that is wanted to be used next year; but it is considered best to leave all to grow beyond this point, and never shorten in the long canes, as it is not necessary in our climate to secure the ripening of the wood of our native Grapes. True, it has been and is still the practice of many to shorten-in these branches, during the summer, but some intelligent persons have been pursuing a different course, running into the other extreme, having observed, as they supposed, the injurious effect of too close summer pruning. Now there is reason in this policy, which commends itself to the favorable consideration of all vine-dressers, who, being students of nature, begin to realize that there is really a *function* to be performed by the leaves of a plant, beyond the mere ornament and shade they provide; and close observers are also aware of the injuries that may happen to the first leaves from hail, the ravages of insects, &c.: hence the policy of leaving more foliage upon the vines, to aid in the elaboration of the sap for the growing crop. There may be a time, in some situations, however, when it will be advisable to pinch-in the ends even of the growing canes of wood that have been laid in to supply bows for the next year's

crop; supposing that *excess* of shoots and laterals have been broken out during the season, as before advised. The object of this pinching-in is to ripen the wood, if it continues to grow very late, and also to keep it from blowing about. At the same time the canes are to be tied to the stakes, to keep them in their places, as they may be much injured and broken by the wind, if loose.

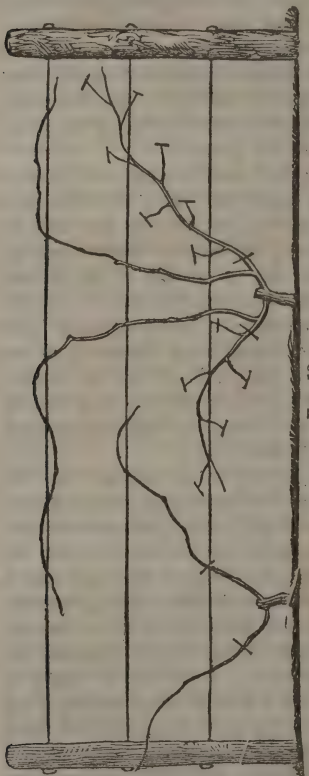


FIG. 13.

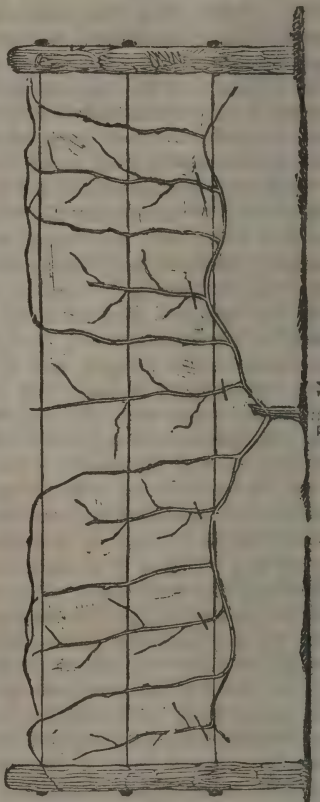


FIG. 14.

The *early* summer pruning by shortening of the vines, has been already urged, but its importance must be the excuse for reiteration. No one should neglect attending to this important element of summer pruning, in its proper season, before the blossoming; for by such neglect the strength of the vine will have been uselessly expended upon many a shoot that must be sacrificed, or, at least, which will have been lost by

not having been properly directed. The extreme end of the shoot may be easily removed with the thumb-nail, and a change in the direction of the flow of sap is at once effected towards the canes destined for the next year, while the bearing shoots will receive an abundant supply for their own leaves to elaborate for the fruit. All vine-dressers are not, however, agreed upon this early pinching-in. The blossoming is, by many, considered a critical period; and such persons advise that no work be done in the vineyard while it lasts, and especially they will advise that the bearing shoots be not shortened-in, as is too often done, close to the bunch. It is agreed, as stated above, that two or more leaves should always be left beyond the fruit. There is reason in this caution. If the shoots be vigorous, and have grown a couple of feet, it must have a considerable amount of sap flowing into it, and directed to the leaves above, which is thus suddenly thrown in upon the fruit, when the upper portion has been broken off too closely. If the summer pruning has been neglected to the time of flowering, it is recommended, by some, to wait until a couple of weeks after the blossoms have set, and then to attend to thinning the redundant wood, and especially to avoid leaving too much fruit.

The Lawn and Flower Garden

INTRODUCTION.

IN order to make our work complete and interesting to all classes of horticultural readers, a few hints on the arrangement and management of the Flower Garden appear desirable. These must necessarily be concise, and shall be as practical as possible. The subject of flowers embraces a wide field, rich in objects of beauty and interest to the cultivated mind and tasteful eye—our great difficulty shall be to walk in it without rambling over the rich expanse. Happily we are not required at the present day, at least, not in this place, to produce evidence of the importance of ornamental horticulture, apart from the more necessary branches of Fruit and Vegetable culture. Who that has an eye to receive and a mind to appreciate the impressions but is impressed with rural beauty; and rural beauty can not in this cultivated age be secured to the masses without the aid of scientific as well as practical horticulture. We have not deemed it necessary for our purpose to subdivide the subject into *Landscape Gardening*, or *Gardenesque*, as a branch of that assumed science is styled. We will content ourselves with including all that appertains to artistic gardening under the comprehensive term Horticulture, and shall only for the present refer to those essential portions of that science that are within the scope of such a manual as this, not presuming to enter upon the consideration of minute details of operations, or to interfere with the various systems of arriving at a desired object, the production of those tender offerings, Flowers.

The claims of flowers to the consideration and respect of man in a state of civilization have been advanced by poets and divines in varied and resistless language. It belongs, at present, to us merely to assume that their arguments have been conclusive, and to furnish the unskilled public with a little practical information to aid them in securing and raising around them the delicate offerings of Flora: for few who love flowers—and who does not—but desire to be familiar with them—to have frequent and intimate intercourse with their varied and pleasing forms. It is not enough that we observe them carelessly as we pass, blooming in silence, diffusing fragrant odors, and displaying dazzling tints; they must be treated as familiar friends and daily associates. Few indeed of our people are debarred their companionship; the most humble citizen may secure a few gems and scatter them around his dwelling, whether located in the open prairie or Indian jungle, or more socially situated in the suburbs of our great commercial cities. Even the grasp of speculators has not been able to drive them from their most frequented thoroughfares; for occasionally the eye of the busy merchant, as he hurries along, is arrested by some eloquent witness, something infinitely superior to the shining dollar, pointing, as it does, to a superior power mindful of our most delicate gratification.

We presume that in the perfection which man's intellectual nature will reach, and the gradual debasement of the sensual, the taste for flowers will be almost universally diffused. The progress within the few past decades has been rapid and startling. The achievments of the past have been, however, more in the expensive and showy departments of the business than in the popular branches. More has been done to enrich the conservatories of the more wealthy of our citizens by foreign rare introductions than to extend the general taste for gardening among the operative classes; yet it is in this direction that we hope for the most salutary effect from the cultivation of this refined taste. So long as the taste is confined to a few, or at least the means for gratifying that taste, just so long will we continue dependent on the more perfect arrangements of Europe for our supplies, not only of new plants and new fruits, but for the current horticultural literature, and the skill and neatness of our gardeners. Why should we continue in this second rank, while we have material to rival if not to surpass those in the first. For this reason are our horticultural journals left to languish for lack of support, because a select class only is alive to their importance.

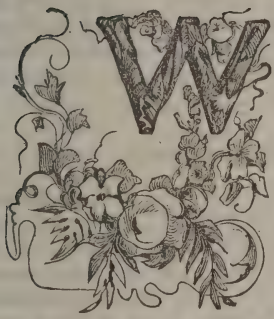
We hope to see every family in possession of a flower garden, or at least to find every dwelling surrounded with its neatly kept lot: this in addition, of course, to the more necessary requirements of the vegetable garden; but in those instances where the extent of ground is very limited, we should desire that the flower garden should have the preference: for while a small lot will produce but a small proportion of

esculents in comparison to the wants of a family, the same extent of ground would by care and attention be sufficient to furnish a boquet of flowers every day during the season in addition to the beautifying of the homestead, and while our markets are bountifully supplied with fruits and vegetables at reasonable prices, we can seldom command a neat, fresh bunch of flowers.

Our chief difficulty in suiting these remarks to the requirements of the class which we most desire should profit by them, is the great variety in means and appliances, the endless dissimilarity in tastes and circumstances which characterize the mass of our intelligent mechanics. There is, we are proud to say, little difference of opinion as to the propriety of some improvement in the arrangement of their yards. They only want to be put in the way of an economical plan to effect this.

Commencing with the smallest space generally allotted, we could show that a little skill and taste is of as much importance in securing neatness and effect, as in the most complete garden or pleasure ground. A few fundamental principles lie at the base of all our operations, and system must be attended to. The same great laws of vegetation are everywhere operative, from the commonest weed and most diminutive plant to the tallest tree or most superb exotic. Nature operates not in a special, but general system of arrangement. The nature of soils by which the required food is to be furnished to the growing plant, demands attention among the first considerations. The supply of air, and following it, moisture, to render the nutritive portions soluble and in a fit state to be taken up by the rootlets, whose facilities for such absorption are of such a sort as to require a certain solubility in the food destined to sustain the vegetable organism; the preservation of the soil in a proper texture for the distribution of the tender fibres of the roots and the exclusion of a superabundance of water, which excludes air and disarranges the chemical condition as well as texture of the soil; — these are points which the intelligent cultivator, whether his field of operation is limited to the eighth of an acre or extends to a thousand acres, must attend to, if he would act with a certainty of success. But to these details we can only call attention as the basis of future operations. Our country is now well supplied with elementary treatises on all subjects relating to the soil and the plants which it bears.

PREPARING THE SOIL AND LAYING OUT THE GARDEN.



HILE nature has supplied material in abundance, variety of surface, hill and valley, rock and glen, and clothed them with ever verdant foliage, interspersed with forms now bursting into spring beauty, and gradually ripening into the rich tints of autumn ere the severity of winter divests them of their robes; spread out the green field and dotted it with flowers, and even beneath the shadowing branches of our forest trees may be found in silent beauty rare and sparkling forms in tender flowers — still these are not arranged so as to please the fastidious taste of man. He has presumed to re-arrange them, and what more laudable, what more innocent employment could he devote himself to, than that of grouping around his dwelling in more limited scope, but still with a view to preserve those symmetrical ideas impressed upon him by observance of the Great Artist's work, the pleasing forms of vegetable life. It is conceded that we are living in an artificial state; that is, that we have adopted a style of life to suit our own tastes; that from age to age new modes have been introduced by common consent, and these modified from time to time are popular for the time being. Gardening has in all ages had its share of attention — has its ancient, middle age, and modern style, while each race or nation has its own peculiar idea and form of arrangement. In our own day we presume that we have arrived at a point and established a style more desirable for our circumstances than any which has preceded it.

The smooth, green lawn spread out in front of the mansion, with its groups of trees, various in their outline and character, collected from various latitudes and widely distant countries, yet to a certain degree patient of our climate, and shrubs, some of them originally natives of Japan and China or the lofty ridges of the temperate Himalayas, side

by side with denizens of the Pacific islands and the more northern regions of Asia and Europe—these give American gardening a peculiar and distinct feature. And such attractions are within the means of all who can afford to spend a few dollars annually for the decoration of the ground around their dwellings.

This system has gradually become necessary to every garden lot, if we would not be behind the age and submit to be laughed at by the passer-by, who, with a full view of our front yard, fails to discover the necessary elements of the *Gardenesque* style—to use this newly manufactured word. Keep pace with the age and spend a little time and a few dollars to secure neatness and system.

If your dwelling is small and your lot in proportion, do not aim at effect in a fourth of an acre; you can have a very neat front yard, but not variety of surface, and not much variety of walks and flower beds; in such cases the most neat and simple arrangement is the most easily managed, and will give most satisfaction.

PREPARATION OF THE GROUND.

Presuming that the ground is in a rough state after the construction of the dwelling, the first operation is to level the surface. In this you should also attend to the quality and texture of the soil, and if undrained drain it. This is essential; in draining a small lot the extra labor involved will be amply repaid. The drains should be at least three feet deep and about fourteen inches wide at top, sloping to ten inches at bottom. The direction of the drains being decided upon, which should be with the slope of the ground so as to secure a descent for the water, they should be cut at a distance of from twelve to eighteen feet apart, according to the nature of the soil; in retentive soils they must be as near as twelve feet to be effective. Cut them at least three feet deep. They should be marked out with a line, cutting along the line with a spade on each side, the surface soil to be carefully laid on one side, so that it may be replaced; all the remaining soil should be thrown on the opposite side of the drain, viz, on the right of the workman; the entire extent of the cut should be cleared out before you commence to fill it in, so that the descent may be gradual and without obstruction. The most suitable material for filling the drain is the tile, where it can be conveniently obtained, filling up with a few inches of small stones, and on the top of these with any rough material, finishing with the soil which had been taken out. The surface should not be leveled, as the soil will settle in a few days. A portion should, be left to meet this deficiency. The top of the stones or other material should be kept at least twelve inches below the surface, so as to be beyond the reach of the spade in future operations.

We have given these brief hints on draining, convinced that without this precaution all succeeding labor would be productive only of disappointment; for no plant will flourish where the subsoil is wet and the surface soil *soured* by the constant rising of the water to the surface, which, in its evaporation by the solar heat, cools down the surface, for evaporation is, as all know, productive of cold, so that in addition to other disadvantages, the wet, undrained soil is later in its production than similar soil drained properly. The great point, however, is the admission of air, which can never be secured while the pores of the soil are filled with water. Some shallow observers imagine that draining is not only unnecessary, but an evil, while the soil becomes at times too dry. This idea has ceased to be prevalent among intelligent cultivators, as it is well known that the rising of the water to the surface, and its evaporation, causes the soil to become baked and impervious to air.

The next consideration is the trenching, spading, or leveling of the soil. Both these results may be secured by the same operation to a certain extent, unless the surface is very irregular; where this is the case, the irregularities should be removed by casting the soil to the lower portions and spreading regularly with the spade. Trenching may be considered as deep digging, with this difference, that the surface soil is replaced in trenching by the fresh soil from below. We need not here describe this operation, but may suggest that while it is a most effectual method of cultivation where the surface soil has been long in active use, it is not advisable where the subsoil is stiff or retentive; for by removing this to the surface, the roots of the plants will fail to find in it the necessary food until it has been acted upon by the atmosphere, and meliorated by its influence. In some cases half the subsoil is brought to the surface and mixed with the upper soil, by varying the operation a little. In raising crops of vegetables this is a very necessary operation; but in the common routine of flower gardening it is not so important, and is only necessary once in several years.

Digging is the most usual method of leveling the surface, and though very few who own a garden would be willing to admit that they do not know how to dig a square, yet it is nevertheless true that there is no operation more frequently performed carelessly than this; and nothing but practice and proper training will enable a gardener to perform it efficiently. It is when properly executed the most effectual method of removing trifling inequalities of surface, which, although apparently of little consequence at first sight, have a decided effect upon the plants which may in future occupy the ground.

The most convenient method in digging is to divide the ground into strips of about twenty yards in width, if only one man be employed in the operation. Commence by taking out a trench of about two feet

in width and remove the soil to the further end of the strip, where you are to finish. This affords what is termed an *opening*, which permits the soil to be properly reversed. The opening is closed at the end by the soil deposited there. In spading a small square, the soil taken out may be scattered over the undug ground, always throwing back a few spadefuls as the opening becomes closed.

And here I would suggest the propriety of every man, desirous of cultivating a taste for horticulture, deciding upon conducting these operations himself, if the extent of his ground is not too much for the leisure at his command. A little extraneous aid may at times be called in to perform the more laborious portions of the work in the early spring and in the fall; but to enjoy a small garden and to feel a real interest in the recreation of gardening, he should be his own gardener. He may call the members of his family to assist him, especially the ladies, though indeed the ladies are in most cases the industrious and efficient gardeners of the family. They have not failed generally in their gardening undertakings, and many ladies to our own knowledge assume the superintendence of extensive gardens, where green-houses and the whole routine are under their control. We do not recommend that they should burthen themselves generally with such an arduous undertaking, but a little cottage flower garden is never more attractive than when it is conducted and attended to by female hands. Nor is there any description of recreation more conducive to health than this.

LAYING OUT THE GARDEN.

The prevailing taste in the laying out of the grounds attached to the dwelling house is decidedly in favor of the lawn with beds of various fanciful and irregular shapes cut in it. With a little attention and proper management, we believe it is the neatest, and is free from many disadvantages attending the geometrically arranged flower garden with gravel walks and edging. Nothing looks more desolate than a group of beds overrun with weeds, intersected by some divisions, which were intended for walks, but by a few weeks of neglect have become green with herbage. The edging of such beds in a few years requires relaying, while the very necessary operation of digging and stirring is not so easily performed as when the flower beds are cut in the smooth lawn. We should recommend that the ornamental portion of the ground be laid down in grass, as the most pleasing and neatest style.

The ground having been leveled, the walks must be marked out and formed. For this purpose a garden line will be required, and a number of stakes or pegs of about three feet in length, sharpened at one end, by which the line is to be guided in forming curves. Any strong

cord will answer for a line, provided it is strong enough to bear being stretched tightly; such lines are, however, on sale, already prepared and rolled on a frame.

To secure a firm and dry walk it is necessary to throw out the soil to the depth of about two feet; if the subsoil is of a gravelly nature there will be comparatively little labor. A good drain must be constructed to carry off the water which accumulates during heavy rains, as well as to ensure a dry walk at all times. Gratings are required at intervals connecting with this drain; they must be placed at the lowest portion of the walk in such a manner as to be nearly on a level with the surrounding gravel. Curved walks are generally adopted in preference to straight lines, but care should be taken to make the curve graceful, not too sharp, and never to form a double curve in a limited space. In gardens where the geometrical flower garden is preferred, the main walk must of course correspond; but when the approach to the house leads through the lawn, a gently curved line should be adopted.

The width and direction of the walk having been decided upon, stakes should be set at intervals of a few feet to indicate the line; and measuring the width with a rod, commence on the opposite side to set stakes corresponding with these at an equal width along the entire line. The *line* may now be stretched along one side so as to coincide with each stake: if the stakes are not regularly set they must be altered until the line touches each. The eye must be the guide in regulating the curves. The opposite side to be arranged in a similar manner, taking care that the width is equal between the opposite stakes along the entire walk. The edge should now be cut with the spade by running it along and pressing it with the foot. The soil may now be removed and thrown on each side until a sufficient depth is formed to allow the filling in of the rough material, such as broken stone, of which the walk is to be composed. The depth of this rough material should be one foot or fifteen inches, to be covered by about six inches of rough gravel, and above this a few inches of fine gravel for the surface. Before the addition of the latter, a verge of grass turf cut from a close pasture should be laid on each side perfectly level to form the margin of the future lawn. These turves should be pared off as thin as possible in lengths of about two feet; the edge cut perpendicularly, and not sloped as is the common practice among unskillful workmen, so that they will lay closely together when placed, the ends coinciding and becoming after a few weeks one continuous line or border, the divisions being no longer visible; to secure this result they must be beaten firmly with the back of the spade, and afterwards rolled. In laying grass edging the sods should always project a few inches on one side beyond the intended width, which allows for trim-

ming with the edging knife or sharp spade, so as to secure a neat edge to the walk. The side towards the lawn, when properly beaten and pressed, unites with it, and does not require trimming. When such verges are laid along a walk with shrubbery or flower border on the other side, both edges must be neatly trimmed, leaving the verge one foot wide, or at least nine inches. Those who have not had any practice in such operations, might at the commencement fail to execute the work very neatly; but let a commencement be made and the novice will gradually become expert, and will feel much more pleasure afterwards in reviewing his own work than he would experience in superintending hired workmen, finding fault with their slow movements, and the astonishing length of the labor bill.

FORMING THE LAWN

The formation of the lawn next demands attention. The walks being constructed, before the surface coat of gravel is added, the ground intended for the lawn must be leveled, dug over, or trenched, so as to secure a good free soil for the germination of the grass seeds and their future support. The most suitable soil for this, as well as for a flower garden generally, is a friable loam, rather tending to sand than clay. While a clay loam is desirable for heavy cropping, and would consequently be the most suitable for the kitchen garden, the sandy loam is to be preferred for lighter purposes, as it is more easily worked, and encourages the growth of the roots of plants more speedily; it is also of a warmer nature than clay, not retentive of water, nor so liable to bake on the surface. Its disadvantages, on the other hand, are, that in very dry seasons it becomes too dry; and while plants in clay soils well cultivated suffer comparatively little from drouth, those on very sandy soil will be parched. This can be obviated, or at least modified, by the application of vegetable mold or other absorbing materials as manure or as top dressing, technically styled *mulching*, a very important aid to all trees and plants in a dry season. Should the soil of the lawn be decidedly deficient in any of the essential components, they should be supplied, if you intend to secure a neat and smooth lawn, clothed with soft and tender herbage. It has been duly observed that in cases where the soil composing the lawn was sour, made up of rubbish of all kinds without any precaution as to its texture or composition, the coarse and spontaneous grasses flourished so rapidly as to entirely choke up and overshadow the tender sorts sown with care. After deep digging, the ground should be pointed over with the spade, that is, lightly dug so as to reduce the lumps and level the surface. It should then be raked and rolled so as to compress or consolidate it,

taking care to secure an even surface, free from depressions. The whole must be finally raked to prepare it for the seed. These operations may be performed at two seasons of the year, but we should much prefer the autumn for various reasons. When the spring opens, so little time is afforded for the work of that season, that any operations which can be performed in the autumn should be dispatched. Laying down to grass is one of these, and this when done in the latter part of September or in the first two weeks of October, succeeds better and is more satisfactory than when left till spring. The grass seeds germinate freely in the warm soil, and have, if properly treated, sufficient time to attain a growth to stand the winter; so that when the spring opens your grass will be established. Some persons, whose lots are not very large, prefer using turf for the whole surface; if that can be conveniently obtained in the vicinity, advantage should be taken of it, as it forms at once a fine sward, provided it is from a close pasture field which has not been cultivated.

The kind of seed to be selected is a matter of some importance. The practice has been to use several varieties in mixture, while many prefer some particular variety. The *Red Top* (*Agrostis rubra*) has succeeded better than any other sort by itself. It has been now fairly tested. *Perennial Rye-grass* has been strongly recommended by several writers and a few practical men. This if at all neglected forms a coarse, tufted surface, and on uneven ground is not at all desirable. *White Clover* is a favorite with many, as it spreads rapidly, and is of very low growth. It has a tendency, however, to choke the other grasses, and is by some regarded as injurious. There are many soils which are not suited to it, while *Red-Top* will grow on almost any cultivated ground. *Sweet Vernal Grass* is very desirable in a mixture, as it is a grass of fine foliage and dwarf habit, while it is a favorite on account of its proverbial fragrance when cut. *Green Grass* is another variety popular in some districts; this is one of the meadow grasses styled *Poas* by botanists, and is a good sort for some localities. In shady situations the *Orchard Grass* succeeds while the more delicate varieties fail. It is, however, a coarse grass, and not to be recommended except for special locations. On the whole we would recommend *Red Top* as preferable when only one sort is used. Those who would rather try several varieties, should use one-half *Red Top*, one-eighth *Sweet Vernal*, and three-eighths *Green Grass* (*Poa pratensis*). When *White Clover* is used, it should be sown by itself before the other seeds. The quantity of seed required for an acre varies from two to three bushels, according to the fertility of the soil; with white clover two bushels is quite sufficient, allowing one bushel of the clover, or one-third of the whole. For smaller portions, a suitable proportion may be computed from the above.

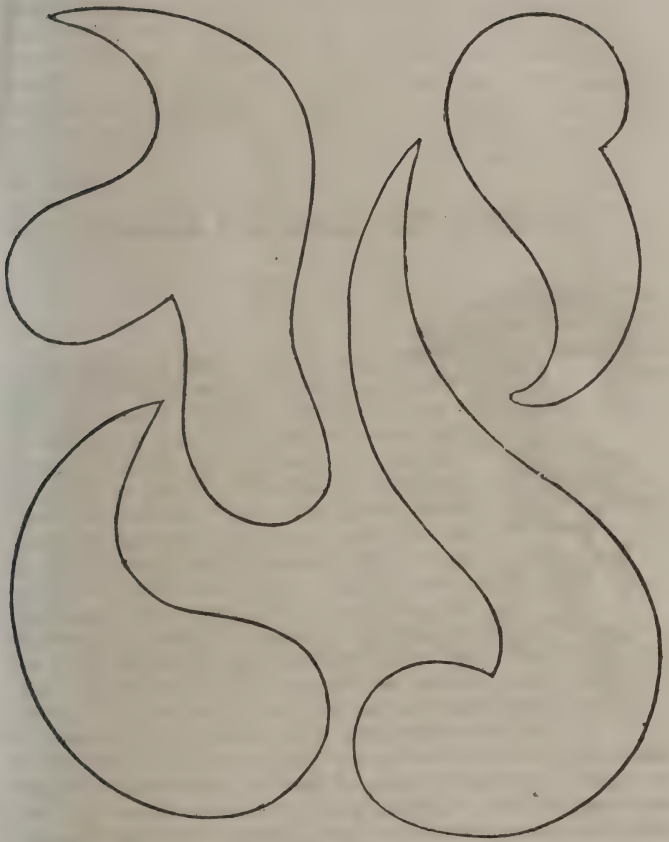
Care must be taken to sow equally and in calm weather, so as to

provide against the waste of the seed. The surface must be carefully raked over to cover the seeds lightly, not as you would rake a gravel walk, but just lightly, to turn over the soil on the seeds. A roller should then be passed over to consolidate the whole. To encourage the growth of lawn grass, a light top dressing of compost prepared from bone dust and charcoal refuse, or guano mixed with light loam in about equal parts, sown over the ground in the proportion of about four bushels to the acre, will much promote the luxuriance of the grass. This must be applied in the spring, when vegetation commences, and before rain if possible. Liduid manure is still more efficacious, but not so easily obtained or applied. Frequent mowing is perhaps the most promotive of the luxuriance of the lawn; at least as frequent as the growth demands, which will depend, of course, on the state of the weather; a few inches is a sufficient height for any lawn grass to attain. After mowing it is important to clear off the cut grass effectually. Lawn rakes are manufactured for this purpose. A little care is required at first in using them, but in practiced hands they are effectual.

We have said all we think necessary here on the arrangement of the lawn. The importance of this portion of the ground to the general beauty of the place is well known; and when satisfactorily completed, will prove a sufficient recompense for all the care and labor expended on it.

The flower beds or figures may remain unfinished till the spring, when the surface will be better prepared for their being cut out. There may be a great deal of taste displayed in this portion of the work on an extensive place. Where the extent is limited, neat beds cut a few feet from the walk around the lawn will look better than any geometrical plan could do if on a small scale. In establishments where a skillful gardener is employed, he of course will exercise his taste and vary the arrangement to suit his own ideas. Were it possible for an unpracticed person to arrange his garden satisfactorily, construct walks, lay out beds, &c., from hints conveyed in this, or even with the aid of plans, we might deem it necessary to furnish such in this place; but convinced that when the ground exceeds an acre in extent some professional aid must be resorted to, if a neatly planned garden is aimed at, we have not entered largely into the subject of forming the flower beds, but shall proceed to describe the varieties of trees, shrubs, and plants most desirable for the various circumstances of the amateur who depends on his own judgment to guide him in the beautifying of the ground attached to his residence. On the opposite page we have given a few of the most simple forms of flower beds, to be cut on the lawn, which the amateur gardener can vary to suit his taste.

We do not aim at enabling the amateur to dispense with the skill of the professional gardener by the brief hints we are enabled here to



FORMS FOR FLOWER BEDS.

present to his notice, therefore the details of forming the figures, &c., shall be overlooked, in order that we may enter more fully into the merits of the various objects which have been collected from different regions of the world, and now rendered available for the decoration of the American garden.

PLANTING THE LAWN AND GARDEN.

THE passion said to exist for exotic plants in preference to those indigenous to our climate and suited naturally to our soil, is, after all, not so unreasonable as many would have it appear. It is not that the American planter prefers the tree imported from Asia, or Africa, or Europe, to that grown on the American continent, but that these products of a distant climate have been brought prominently before him by the enterprise of foreign nurserymen, while the attractive shrubs, trees, and plants of this continent are comparatively unknown. It must be admitted that *fashion* has something to do with it, for we must attribute the frequent importations of trees and plants from European houses to the fact that it has latterly become fashionable to be known as an importer of choice plants from the London and Paris nurseries; though most of the rapidly increasing collections of American nurserymen and florists could furnish the very choicest plants at a much cheaper rate and with much more satisfaction to the purchaser. We must, however, still look for many choice novelties to the old world, with its long established societies for the promotion of horticulture, and the extensive machinery at work to secure the gems of every clime; its well managed Botanic Gardens and Public Arboretums and their commercial establishments, whose agents are abroad in search of novelties wherever the tide of civilization has reached or the skill of the collector has been successful in effecting an entrance.

We would not however, overlook our indigenous trees and shrubs, in which the American continent is rich, nor forget that good taste will not discard or reject a noble tree or graceful shrub from the domains of

artistic gardening because a whole forest of similar specimens may be found a few miles distant. To the lover of natural beauty no such argument can have any weight. That portion of the gardening public who have been brought up under the more temperate sky of France or England, and have become attached to many trees and shrubs better suited to that latitude and its peculiar climate, must learn here to bear the slight disappointment when they discover that their favorite tree or shrub or flower no longer flourishes as they have been accustomed to observe it; but many splendid substitutes may be procured equalling their old acquaintance in every attraction but that of early associations.

Trees and Shrubs are the mantles which shield the mansion from the piercing blasts of winter, breaking the force of the angry wind as it drives in impetuous fury against its protecting walls. Trees, also, are the graceful and delicate shades, always adjusted, which thwart the burning sun in its oppressive visitations, rendering ths sultry summer season tolerable, and the crowded city street at least passable by the busy trader. The selection of a few suitable trees, therefore, is an important part of the business of decoration, not only with a view to the shelter of the house, but as refreshing objects to all who may in succeeding years view their waving foliage and spreading branches. For no passer-by who has the faculty of perception but will silently acknowledge his gratitude to the planter of a noble tree, as he journeys beneath its shade, or from a distance views its majestic form.

A few hints might be useful in this place as to how a tree should be planted. It is not enough that we bury the roots and get them out of sight; they must be properly arranged in their new abode before leaving them. It is presumed, of course, if you expect the tree to succeed, that the soil is suitable; that at least you are not going to drown the tree by setting it in a hole filled with water, but that the subsoil is drained, and the soil friable. You cannot always hope to find just the identical soil that the tree you intend to plant likes best; but with ordinary skill in planting, almost any of our common trees will succeed in good ordinary soil. Dig out a hole fully large enough to receive the tree without cramping or doubling any of its rootlets, let them all be spread out before any soil is thrown upon them; when this is done, a small quantity of the soil should be returned first—enough to cover the roots—which must be well washed about them with a copious supply of water; after this has settled, fill in the remaining soil.

The depth at which a tree should be planted cannot be distinctly specified; the planter must exercise his judgment. The surface of the earth, exposed as it is to the sun's rays, is most genial for the young fibres; and no tree should be planted much deeper than the *collar*,—that is, the point of union of the root and trunk, or stem. If a few inches of soil is added, it should be removed when the tree has taken

with the soil. We should much prefer to add a few inches of litter in the summer, for protection from the sun, than to bury the roots when planting.

A very common question is, What is the most favorable season for planting? or rather for transplanting? Those engaged in the business of transplanting trees will generally recommend the autumn, and it has several important advantages over spring for this purpose. One of the most important in our estimation is the favorable warmth of the soil, which so encourages the rootlets that they recover themselves before the frost has fairly set in; while in spring, before the soil is of a proper temperature to promote the growth of the roots, the heat of summer taxes their absorbing faculties, and if not carefully attended to are liable to suffer. Either season will answer if proper care is bestowed.

DECIDUOUS TREES.

Deciduous trees, or those which are annually stripped of their foliage at the approach of winter, are varied in aspect, form, and habit; some retain the foliage until the chilly season has forbidden us any longer to seek their shade, while others, luxuriating only in the warm breath of summer and autumn, shed their leaves as soon as the frost whitens our lawn; and many reluctantly divested of their rich mantle of green, change it to glowing colors of red and gold, vieing in richness with the tints which Ceres and Pomona use to render their gifts attractive to the eye. Already the Gum tree (*Nyssa sylvatica*) has put on its fall dress, and this will be followed in succession by several species of the Maple and Oak, so brilliant in their autumn tints. Deciduous trees have a peculiar interest on account of this variety of form and coloring.

The tree most popular now among suburban gardeners is the Silver-leaved Maple, (*Acer dasycarpum;*) it is selected on account of its rapid growth and freedom from the attack of insects, at least in comparison with other shade trees. It will, however, become so common in a few years as to be no longer a favorite.

The European Linden is a beautiful tree, but not in much demand, being liable to attacks from insects to such a degree as to render it an eye-sore in many cases; where it escapes this drawback, and flourishes, it forms a beautiful object.

The Mountain Ash, (*Pyrus aucuparia,*) when in a suitable locality, proves very attractive, especially when clothed with its clusters of bright scarlet berries. Its clean wood and pinnate leaves render it very desirable as an ornamental tree.

There are several species of Willows which form very graceful weeping trees. The Rosemary-leaved variety, and what is known as the New American Willow, are very distinct.

No tree is more desirable in a lawn than the Horse Chestnut; it has a compact habit and pyramidal form, while the dark green foliage and spikes of white flowers with a rosy tint add to its spring beauty.

The Purple or Copper Beech contrasts in a very pleasing degree with the foliage of commoner trees, and is a very beautiful object in a proper situation.

One of the most striking of our familiar trees is the American Elm, irregular in its form, throwing its half pendulous branches carelessly around its stately trunk; we know of no finer specimen for an extensive lawn.

We have only space to allude, thus far, to a few of the trees desirable to furnish shade and protection around the mansion. Many more, equally suitable and attractive, could be recommended. The Black Walnut and Sweet Chestnut must not, however, be overlooked.

EVERGREEN TREES.

Retaining their foliage throughout the season, and imparting as they do a warm aspect to the otherwise dreary landscape, we must now turn to the evergreen trees. These are too sparsely scattered over the country, or the stranger who visits us in the winter season should not have to complain of its naked appearance. What is more refreshing, "when autumn has stripped every leaf from the mountain," than a group of stately Pines, retaining the verdure of spring in the depth of winter. The eye rests on such an object with satisfaction, and the heart feels grateful for verdure in winter. There is no scarcity now of choice evergreen trees and shrubs, and no person of taste can be excused for neglecting to plant. We would not desire to encourage the planting of those tender species, which, though very graceful and beautiful in the summer and autumn, are checked in the northern States by the severity of the winter,—frequently losing several feet of their young wood, and afterwards presenting a very unsightly object to the disappointed owner. The more hardy and fully tested trees, such as Weymouth Pine, Scotch Fir, Austrian Pine, Hemlock Spruce, Norway Spruce, Cephalonian Pine, Balsam Fir, Silver Fir, and other such familiar species, give in the end most satisfaction, Of these we cannot help particularizing the Hemlock Spruce, (*Abies Canadensis*,) and Norway Spruce, (*Abies excelsa.*) To those who have seen these trees in a favorable situation, in good condition, we need not say a word in their favor. To those who are not familiar with their grace and beauty, we would say, inquire of some

NORWAY SPRUCE.

of your friends where you may have the gratification of viewing them. The trees noted above are easy of cultivation. The great point is not to aim at transplanting large nursery trees; those of a few feet high will, if they have been properly treated by the nurseryman, give more satisfaction than those much taller. The Hemlock Spruce is somewhat impatient of removal; its spreading fibrous roots can not be taken up with much of a ball. The beauty of this common tree will repay for a little extra care.

SHRUBS.

Shrubs, deciduous and evergreen, are perhaps the most useful and attractive objects we can employ to add to the beauty of the lawn and garden. Such is the variety now within our reach, that by a judicious

selection we may have a succession of choice flowering shrubs at a very trifling expense; and when these yield to the inclemency of the season, many graceful and attractive evergreens may compensate for their temporary decadence. What is there richer or more refreshing than the Lilac shrub, (*Syringa vulgaris,*) and its numerous varieties. We see it in every garden, and each day during the spring months we admire it afresh. So luxuriant in its flowering, so grateful in its fragrance, this at least every one selects among the first.

A new claimant for attention has made its appearance within the last few years. Though some eight or ten years have elapsed since its introduction to English gardens, it has not become very familiar with us until within the last four years. To satisfy the demand for short names, a very accommodating florist in this respect named it the *Golden Bell.* Its proper name is *Forsythia viridissima.* You will find it in all respectable catalogues, if not in the nursery. It forms a very attractive and showy object in the month of May, its strong shoots being clothed with its golden yellow flowers before the foliage begins to expand fully. We expect to see it as common in gardens as the Deutzia, or Lilac.

How often, on our approach to the neat front yards in the suburbs of some of our cities, have we been struck with the snowy whiteness of some shrub, which at first we were puzzled to identify, till becoming more familiar with its appearance we discovered it to be no less than the *Spiræa prunifolia,* or the Double Plum-leaved Spiræa. The popular name in this case exceeds the technical in length. No matter what name it is known by, we wish every one to know the shrub; having seen it once in a luxuriant state, it cannot easily be forgotten. It has the advantage, in addition to its rural beauty, in being very well adapted for forcing during the winter. Many splendid plants in pots may be seen in February and March in our conservatories. It has become so great a favorite, that every florist propagates it in quantity until it has become quite reasonable in price. Several species of the Spiræa family are almost equally desirable, though not perhaps so much cultivated as the one just alluded to. *Douglas' Spiræa* flowers later in the season, with showy rose-colored blossoms. *S. Reevesii* comes into bloom a little later than *prunifolia;* the whole plant is covered with heads of white flowers, forming one mass of bloom. The family now numbers about forty shrubby species, suited to this country. One of the latest introductions is perhaps one of the most beautiful; it is called *callosa,* and was introduced by Mr. FORTUNE from China. It is a free blooming dwarf shrub, with delicate pink flowers in dense clusters. The foliage has a peculiar bronze tint, contrasting agreeably with the light green of other shrubs.

We cannot dismiss this part of the subject without calling attention to one other shrub, which has, during the few years since its introduc

tion here, become a great favorite; it is also from China, and one of the most desirable of the many plants procured from that rich country. We refer to *Weigelia rosea;* it has not as yet been favored with a more

WEIGELIA ROSEA.

popular name. It is a hardy, free growing shrub, bearing a profusion of light rose-colored tubular flowers, somewhat resembling the *Azalea* flower in form. It blooms in May, and is furnished with vigorous foliage. A still more recent introduction is *Weigelia amabilis*, but not superior in point of merit to the former. A third species of this family is cultivated under the name of *Weigelia splendens*, which is very little better than one of our native shrubs—the *Diervilla lutea.*

Very few gardens are without the well known *Deutzia scabra*, but a much finer species of the same family has been more recently intro

duced, the Graceful Deutzia, (*Deutzia gracilis,*) a very dwarf growing shrub, with an immense profusion of pure white flowers. Nothing can be prettier than a neat plant of this charming shrub when in full bloom. We might extend our notes of choice deciduous shrubs to a much greater length without exhausting the rich store of novelties, but we must be satisfied for the present, and shall refer to a few choice evergreen shrubs.

The effect of a neat lawn is much increased by the selection of a few shrubs of evergreen character, on which the eye may rest with satisfaction when the surface of the earth is robed in white. The different species of Arbor Vitæ first present themselves. Their form and habit is rendered somewhat familiar by an old acquaintance. The American Arbor Vitæ, or, as some term it, "White Cedar," is itself a very beautiful shrub, frequently employed to screen unsightly objects, or as a hedge; still, when planted apart, it forms a splendid plant, and generally succeeds well. The more select varieties are the *Chinese, Siberian, plicata, aurea,* and *Wareana;* of these the *Chinese* is most in use. The *plicata* forms a very dense shrub, with dark green foliage, and is more select than the former, being generally higher in price. The Golden Arbor Vitæ is a very pretty shrub, but a little scarce as yet, and therefore commands a higher price. The Arbor Vitæ is the standard evergreen of our day. The several varieties enumerated vary only in habit and form, but resemble each other in general aspect.

CHINESE ARBOR VITÆ.

The Red Cedar, (*Juniperus Virginiana,*) is so well known that it requires but a passing notice. The only objection to its being planted is that of being too common; the man of taste, however, will not exclude a handsome hardy evergreen from his grounds on this account; and in many situations no substitute can be found for it. As it grows spontaneously in almost every district of country north of Virginia, few nurserymen think it worth a place in their grounds; a few, however, cultivate it for hedges, for which it is not very well adapted. There is a great difference in the habit of this tree under various circumstances;

several forms continuing so distinct as to be considered permanent varieties.

The Swedish Juniper, (*Juniperus Suecica,*) is a great favorite with some; it is characterized by a distinct tapering pyramidal form, with stiff, bluish green foliage. It looks well on the lawn.

The Irish Juniper is preferred by many to the preceding variety; its habit is denser, and the shrub more inclined to be dwarf.

The family of the Yews contain several handsome species; the very dark green of their foliage distinguishes them from the Cedars and Arbor Vitæ.

English Yew, (*Taxus baccata.*)

The Common Yew, (*Taxus baccata,*) is a spreading shrub of rather slow growth, but very beautiful when once in a flourishing condition. Some care is requisite in transplanting the different species of Yew, as the roots are not so finely fibred as in the shrubs already noted.

The Irish or Upright Yew is much in demand for cemeteries, but its success has become so doubtful, from want of care in planting and proper attention afterwards, that few persons ever realize their expectations in planting it. It suffers most from the effects of the sun's rays in

the early spring, after the severe frosts of winter, and much more from thawing than actual frost. It should be shaded in such cases from the sun's rays during the day.

There have been many late additions made to the evergreen trees and shrubs which belong to this section of the vegetable kingdom; some of these are exquisitely beautiful, but unfortunately not calculated to withstand our winter. South of the Middle States they succeed well, but north of Southern Pennsylvania are very precarious objects for out-door planting. We cannot pass them, however, without enumerating a few favorites.

No tree of its character has been brought so soon into notice as the Japan Cedar, (*Cryptomeria Japonica.*) It may be found in the city lots of those who delight to experiment with everything novel and beautiful; but, alas, many have been doomed to disappointment; for during the past winter (1855) the favorite *Cryptomeria* yielded to the subduing blasts, with the thermometer some few degrees below zero. When housed during the winter, and gradually exposed in spring, it forms a pretty shrub for the lawn, where it may be temporarily placed by plunging the pot, or box, and replacing the turf.

The beautiful Funebral Cypress, also introduced from Japan, when treated similarly, forms a pretty plant. It is not yet so well known as the former.

The Deodar Cedar, which succeeds tolerably in the vicinity of Philadelphia, will not winter in the Genesee Valley. Both this and the *Cryptomeria* were injured,—the latter entirely killed, the former much cut up.

A few low-growing evergreens remain to be noticed before proceeding to the department of flowering plants.

The *Mahonia aquifolia,* to which the popular term *Ashberry* has been applied, attracts by its waved and glossy foliage the eye of the passing visitor, no matter how much of a novice in arboriculture. And this is the great point, to attract the attention, to awaken the curiosity of the listless saunterer along the interesting walks of the garden, and shrubbery skirted by the marvellous creations of the great Artist. In addition to its striking foliage, it bears a cluster of yellow flowers, and is on the whole a desirable evergreen undershrub, suitable for forming a bed on the lawn,—a style which has lately become more common in American gardening.

The Sheep Laurel, or *Kalmia,* is also successfully employed for this purpose, and nothing can be more rich than its delicately white flowers surmounting its fresh green glossy foliage.

The Pyracanth is one of our favorites; we admire it for its irregularity of form and shining dark green foliage, changing in winter to reddish brown, but soon re-assuming its natural hue. Its bright red

berries, lasting during the entire winter, has entitled it to the appellation of Christmas Thorn.

But we must close this dissertation on shrubs, and refer the reader who is desirous of information to more extensive treatises on the subject. *Meehan's Hand-Book of Ornamental Trees* will supply many useful hints on arboriculture, with minute details of many individual specimens. We cannot, however, at present, recommend any similar treatise on *shrubs* unless we may prepare one.

ROSES.

Next to a judicious selection of evergreen and flowering shrubs for the adornment of the garden, the Rose must take its place, as of all other flowering plants at once the most showy and fragrant, as well as varied in character. Each year adds to the already swelled list many choice varieties, all of them having pretension to superiority of habit, or odor, or color, to those of its class which have preceded it. And when we take into consideration the fact that very little, indeed scarcely any, attention is given to the Rose bush by the cottage gardener, we cannot help feeling grateful for the profusion of flowers yielded in return for so little care. The point of its hardiness having been fully ascertained, the plant is set out to bloom perpetually. And perpetual blooming is the *sine qua non* with the great majority of our unsophisticated amateurs. The first question in reference to a Rose is, "Is it a monthly bloomer," or "will it bloom *all the time?*" Now we should like to throw out a few hints on this point to those who may be disposed to purchase plants. They cannot expect dealers, who live by the sale of their plants, to deter them from purchasing a plant by telling the truth about it, at least the whole truth. They should endeavor, before commencing to purchase, to gain a little useful information for themselves.

There is no Rose that will, under all circumstances, bloom every month. There are certain classes of Roses that, provided they be properly managed, planted in suitable soil, furnished with water (if in pots) when required, and supplied with abundance of air and light, may produce a succession of flowers from day to day, or from month to month, during the summer and autumn. They very seldom produce flowers during the winter months. Such are to be found under the head of China or Bengal Roses, and these are best adapted for pot culture, being of dwarf compact habit. But Roses, though generally very accommodating—adapting themselves in a great degree to unfavorable circumstances, require a certain mode of treatment and culture to insure their luxuriant growth and fullness of bloom. The various classes demand different kinds of soil; some are quite hardy, others quite tender, so

that to secure a succession of choice Roses during the year demands a little skill and attention.

First, as to soil. The China or Bengal Roses require a sandy loam, mixed with vegetable mold. In pot culture the nature of the soil is important, as the supply is limited, and should be so prepared that the requisites for the sustenance of the plant should be within its reach. In out-door cultivation, where the soil is diversified, a plant may struggle on for a season, though the nature of the soil is not apparently suited to its wants. For this reason we seldom condemn any medium soil if it is not found to be entirely deficient of some important ingredient, so stiff and indurated as to prevent the growth of the roots, or so sandy as to parch them up in summer; but by all means let the sub-soil be dry, or no Rose will flourish.

Roses generally produce the greatest profusion of bloom and largest individual flowers when supplied with a little rich manure, well incorporated with the soil; that from the stable, when allowed to remain for some time, is the best; for pot culture it is necessary that the soil be made rich, else its fertile properties would soon become exhausted. The ever-blooming Roses, as the China or Bengal section has been termed, are of a dwarf habit naturally, and do not require pruning except to preserve the regular shape of the plant; the straggling shoots, which are generally weak, should be taken off early in the spring, at the commencement of the growing season. Roses of this class may be easily propagated by cuttings of sufficiently ripened wood, set in pans or boxes in a cold green house. Choose short wood, and make the cuttings about three inches long, inserting them in a compost of sand and loam, or woods mold,—about two parts of sand to one of the other. The soil must be pressed firmly,—an indispensable condition to success with all cuttings. The cuttings may be procured either in the spring or latter part of summer. In some cases the pans are placed on a moderate hot bed, but this is not advisable except great care is used. A slight sprinkling of water from a fine-rosed watering-pot is necessary to prevent their wilting, and close attention in removing daily all decayed leaves, and careful shading from the sun's rays, embraces the important points in after management. The plants, when properly rooted, require removal into small pots, say two-inch size, or three-inch if the roots are strong; the compost used for the first shift must be sand and loam with leaf mold, instead of manure,—say about one part loam, one of sand, and one of leaf mold. After potting, the plants must be placed in a cold frame and kept shaded for a few days till taken with the pots, allowing a little air by tilting up the sashes. For the final shift, rather stiff loam with about one-third leaf mold and manure should be used. Those who wish to make a good selection, had better consult some nurseryman in whom they have confidence, as they are more [illegible]

plants by leaving it to their selection. When a list is prepared, they do not feel any objection in this respect beyond the supply of the sorts enumerated.

Of the CHINA or EVERBLOOMING ROSES a selection of six varieties might consist of *Agrippina*, generally known in French collections as *Cramoisie superieure*, a Rose of a rich crimson color, with velvety petals, and a free bloomer.

For a good light variety *Cels* may be chosen, both for its profuse bloom and delicate blush shade, though it has a drooping habit which detracts somewhat from its other claims for favor.

Louis Phillippe is also a well known dark crimson variety, very desirable in a small collection.

The *White Daily* is a popular old variety, of rather slender growth, but pretty.

The *Common Daily*, one of the oldest of the class, is a very desirable blush Rose.

Madam Breon is a good sort; color bright rose, with good size and form.

These, with the addition of *Sanguinea*, remarkable for its brilliancy of color and the peculiar shade of its foliage, though by no means a fine flower, will form a good selection. They succeed well in beds during the summer, and are easily kept during the winter season in any ordinary green house or pit.

While the last section are desirable on account of their free blooming properties, they are generally deficient in the important quality of fragrance. This deficiency is supplied in the TEA-SCENTED ROSES, (*Rosa indica odorata;*) they are, however, more tender than the Bengal varieties, requiring a house or pit during the winter season in this latitude. Many of the varieties have very large and showy flowers, varying in color from pure white to yellow and deep rose; the colors are not generally so bright as in the Bengal section.

The most desirable varieties of the Tea Roses are *Bougére*, a very large well formed flower, of a bronzy color, and very distinct.

Devoniensis—A favorite Rose, of a creamy white shade, and straw colored center; flowers large, and plant of a robust habit.

La Pactole is a fine yellow variety; flowers large and very fragrant; the plant is of vigorous growth, and of the choicest of the yellow Roses.

The *Arch Duchesse Theresa* is a very rapid growing variety, a pure white, and very double flower.

Clara Sylvain is also a good, white, and very fragrant Rose; flowers of good form.

As a select variety, we may name the *Triomphe de Luxembourg*, one of the most profuse bloomers; buds of very fine color, large and showy; color bronzy pink, somewhat resembling that of *Bougere*, but darker.

Differing entirely in habit from the two preceding groups, the Noisette Rose is one of the most admired and valuable forms which this favorite flower has assumed; it grows so rapidly, and blooms in such profusion, while to these advantages it adds perfume, and in some cases ability to withstand a great degree of cold. Our space will not permit us to enlarge further on its peculiar properties. We must be content to refer to a few of the leading varieties.

Amie Vibert is a hardy, white variety, a profuse bloomer, and well adapted for growing as a standard.

Chromatella, or *Cloth of Gold*, is one of the favorite Roses, and has been always in demand as a good yellow variety; it is, however, rather tender for exposed situations, and requires a covering of straw or other protection; its flowers are large and very fragrant.

Lamarque is also a very choice variety; flowers pale yellow, or rather creamy white, but large and graceful; habit vigorous, but somewhat tender until well established.

Pourpre de Tyre is a violet crimson variety, with well formed flowers; much admired for its luxuriant foliage and robust habit.

Fellemberg is another good crimson variety, hardy, and a profuse bloomer; flowers rather small during the summer, but splendid a little later in the season.

Solfatare is one of the most popular of its class; flowers deep yellow, and the plant of vigorous habit. It has been attempted to eclipse its reputation by the introduction of what has been supposed a distinct variety, said to be much more hardy than *Solfatare*, of more vigorous growth, and in every way superior. This question having created a little bad feeling in certain quarters, we believe it more prudent to leave the celebrated *Augusta* to enjoy its reputation, and let those who believe it better than the *Solfatare* substitute it. We readily admit that it is at least as good, and that is no small recommendation.

The Bourbon Rose is the next to be noticed, and under this head is to be found some of our choicest flowers. They are valued for their succession of bloom throughout the season, their regularity of form, and luxuriant habit. They are generally fragrant, and produce their flowers in large clusters.

One of the best known and most admired is *Hermosa*, which must not be overlooked in any selection; it is of compact habit, flowers remarkable for their regularity of form, as they are very double, and the petals firm; blooms profusely, of a beautiful blush color; quite hardy except in the more northern States.

Edward Defosse is a rosy pink variety, with large and double flowers, one of the finest of late introduction.

Souvenir de Malmaison cannot be surpassed in its own class and color, being of large size, fine form, and luxuriant foliage; it is not so easy of

cultivation in perfection as many others, and if not properly managed may fail to bloom freely; flower pale flesh color, blush towards the center.

Leveson Gower is a standard sort, deep rose color, good size and form.

Bouquet de Flore is a light carmine Rose, of very fine form, extra size, and full flowers.

Jupiter can be recommended as a Rose of fine color, being one of the most showy of the class.

The Bourbon Roses are equalled in importance to the cottage gardener by the HYBRID PERPETUALS. These are adapted to the circumstances of those who have not much opportunity to attend to tender plants, as they are quite hardy, robust in habit, and profuse bloomers, with a few exceptions. They are not so easily propagated as some of the other classes; some of the varieties do not succeed by cuttings, and are generally budded. The *Manetti* stock suits admirably for this purpose. Many persons object to budded plants. This arises from carelessness and want of attention in cultivation, which has resulted in many failures and disappointments. Care should be taken to remove all suckers from the stock, as this checks the growth of the Rose, and in many cases the shoots have been encouraged instead of the scion, until eventually the latter died out, and then the short-bloomed, semi-double flowers were all the novice had for his money.

The HYBRID PERPETUALS require a strong clay loam, with sufficient manure to render it friable, as they are of luxuriant growth. It will prove a difficult matter to make a selection of six for so extensive a class.

La Reine is at once one of the most vigorous growers and most profuse blooming variety; the flowers are of the largest size, and good form; it should be in every garden; color rosy lilac; very fragrant.

Caroline de Sansal is superior in form, and of a very delicate blush or flesh color; it is unsurpassed.

Standard of Marengo.—Bright crimson, good form; one of the best new varieties.

Geant des Batailles, or *Giant of Battles.*—This is a much admired Rose, of a brilliant crimson color and dwarf habit, a free bloomer, of good form, and on the whole one of the most desirable.

Baronne Hallez.—A light crimson Rose, of fine form and vigorous habit; is worthy of cultivation.

Mrs. Elliott is a robust, free blooming variety, very distinct and beautiful; color rich purple; flowers extra size.

Sydonie.—A very delicate pink variety; is worthy of commendation for a small collection. There are many varieties quite equal to the above, and perhaps some which might to some tastes be considered

preferable; these, however, if well attended to until established, will give ample satisfaction.

There are, in addition to the classes already referred to, several others. Of these we must not omit to mention the Moss Roses, as they are great favorites, though many fail in their expectations with several of the less known varieties.

The well known *Moss Provence*, or *Cabbage Moss*, gives most satisfaction; its buds, before expansion, are so beautiful that they compensate for the deficiency of color in the expanded flower.

The crimson and white Moss Roses are desirable to form a variety.

A very pretty Weeping Rose is formed by budding the running varieties on a standard stock, and allowing them the branches to hang to the ground.

WEEPING TREE ROSE.

CLIMBING ROSES are in great demand among our amateur gardeners. They are certainly very desirable as covering for an arbor, or to clothe

the dwelling in refreshing verdure,—furnishing a profusion of bloom. If we have been indebted to French and English florists, some of whose noisy titles are quite enough to satisfy our incredulity, if not enhance the value of our importations, we are independent of them in the matter of climbing or running Roses; for we have the *Prairie Queen* and *Baltimore Belle*, either of them calculated to satisfy any old Rose fancier; but these have been enlarged upon, and the result has been a crowd of ladies' Roses, such as *Mrs. Pierce, Mrs. Hovey, Miss Gunnell, Anna Maria*, and others, with the *Pride of Washington* and *Millidgeville*. If these are not real natives, they are at least Americanised; and if we have not gone into an elaborate description of their colors and peculiarities, it is because every one knows them, or at least some of them,—the *Prairie Queen* at all events; and "*ex uno disce omnes.*"

This is a Rosy chapter which is about to close, and we will now talk of some of the more modest plants, such as Verbenas, Pansies, Geraniums, and the Sweet Carnation, so seldom seen in perfection in our American gardens.

BEDDING PLANTS.

The remarks we shall offer on the less prominent families of ornamental plants, may not be as full as they should be to make the subject satisfactory to the reader as well as to us; but already this chapter has reached a greater length than was appropriated to it. The greater matter we find in this country is the decoration of the garden during the spring, summer and autumn months, with showy and rapid growing plants, such as may be obtained at a small expense, and which the owner can afford to lose by the severity of the season, at least such as do not desire to provide a green house or other means for their protection. Those who have the means and taste, no doubt will avail themselves of the knowledge accumulated from the practical co-operation of other amateurs and professional gardeners, and consult more extensive treatises than this pretends to be. Many choice plants, quite sufficient indeed to furnish an extensive assortment of flowers, may be cultivated without the aid of glass structures; but to accomplish this some little care and attention is required. Many roots may be preserved in dry cellars during the season when vegetation is at rest. The sap elaborated in the fleshy tubers of the favorite Dahlias remains in reservation and inactive, until the moist warm breath of spring, by some magic power which nature has so arranged, excites the ready tissue and sends the tide of life on its journey over the stem, branches and leaves. Many other desirable plants can be preserved in this manner. The Marvel of Peru, a well known plant, treated as an annual, will form a large,

woody, tuberous looking root, and may, if of sufficient size, be wintered like the Dahlia. The Coral Plant, *Erythrina Crista-Galli*, we have wintered in like manner; while Salvia, Heliotropes, and others, have been successfully preserved by keeping them in a regular medium temperature,—withholding moisture or any exciting influence. As the Dahlia has been named, a few hints upon its treatment may be introduced here.

The DAHLIA, as we now see it, is as different from what we have been led to believe was its original, as is the splendid double *Cabbage* Rose from the single flower which is produced on the wild stock which we use in the propagation of this flower. Originally from a southern latitude, it is at once effectually checked by a few degrees of frost, and like the Potato, Mexican vine, Canary creeper, and similar tender flowers is cut down entirely at an early period in October in our latitude. The succulent tubers, however, are preserved, and in the beginning of May may be divided at every eye, or sprout, and each will produce a flowering plant next season, should it be fairly treated. The tubes should be taken from the ground as soon as the tops are fairly destroyed by the frost. Cut off the stems a few inches from the ground and take up the tubers carefully, first taking care to secure the label by wire to the stem, so as to preserve the name, then deposit them in any dry place in the cellar or waste room, secure from damp and frost, and not liable to be exposed to a higher temperature than from 50° to 60°. In a very cold situation it would be advisable to cover the roots up in boxes filled with saw dust, dry sand, charcoal dust, or other similar material, as the frost may reach them otherwise. In the spring it is common to remove them to a place where there is an artificial temperature, to excite to growth, in order to divide the eyes,—it being desirable to raise the next season's plant from one strong eye.

Florists hasten their vegetating by plunging them in a mild hotbed, if such is at hand, or even laying them in the hot-house, covering them up with such material as has been already alluded to. In this way they are propagated very extensively, by obtaining cuttings when the shoots thus hastened have become one or two inches long. From cuttings obtained in this way, with single stems, the best plants are raised. The soil in which the Dahlia succeeds best is a clayey loam, well worked; it requires a good supply of manure, as the plant is very succulent, and can extract a large proportion of nutritious matter from the soil.

The result obtained in regard to flowers varies much in different seasons and by different treatment. To be able to select the best and choicest Dahlia is of itself a nice point, and some experience is required to make an individual fully conversant with the names of the varieties so as to distinguish one from the other. They are divided into classes, according to their peculiar characters, as to being tipped, striped, or

what is termed by florists *self* colored. A *self* is of a uniform shade, not tipped or striped; a *tip* has the petal from the middle to the point of a different shade from the other portion; a *stripe* has the petals striped from their insertion on the receptacle to the point. There are also several styles of *mottling*, which vary somewhat from the above distinctions. In each of these classes there are hundreds of varieties, so that when called upon to select the best Dahlia out of about one thousand varieties, the task is a difficult one; but to select twelve or twenty-four out of each class is more practicable. New varieties are added each season to the already swelled list, produced from seed both in Europe and this country; few indeed of those annually produced can compete with the majority of those already introduced to cultivation. Each variety, of course, must submit to some test before it can establish its claim to a place. Many choice American seedlings have been produced by New York, Philadelphia, and other florists over the country; some of them of good form, large size, and of strong constitution, more suitable to our changeable climate than the first rate sorts newly imported. We need scarcely recommend a list here, as in florists' flowers much of the choice depends on taste. A standard has been set up, but this is not regarded by the majority of our amateurs. Of the really select flowers it might be well to particularize a few.

Plantagenet is a good self-colored Dahlia, of large size and fair form; its color is a lilac purple.

Emperor of Morocco is one of the most admired and best known tipped varieties, dark purple, tipped with white.

Baron Alderson is a showy orange, tipped with white; a very large and attractive flower; a late importation.

The Nigger is a dark, velvety, purple variety, not so large as the former, but very good form.

Of the old sorts, *Madame Zalder* is one of the largest size, of a peculiar orange or bronzy shade. An American seedling.

Of the white varieties there are several very large and fine. *Bragg's Antagonist* is one of the best. *Indispensable* is also good. But we must finish here, and leave those interested in this popular though coarse florist flower, to make their selections from the descriptive catalogue of the florist, guided by a regard to the reliability for accuracy and candor of the party by which it may be issued. A good deal, after all, must be left to the honor of the professional man.

Verbenas, perhaps, have been more rapidly introduced to the American people than any other unacclimated herbaceous plant. Unable to bear the severity of our winter, we nevertheless see thousands of this showy and neat border flower at every point over the entire country, where there is any pretensions to raise a flower or any plant aside from the gold producing esculents, Pumpkin and Squash, or other of our

large vegetables. A dozen varieties of Verbenas is a very small collection for even a cottage gardener. And this cannot be a matter of surprise, since we know that in our middle and southern cities they may be obtained for a little over the value of the pots in which they are cultivated, while in the more ungenial northern localities a shilling is about the highest price demanded for a good standard variety. They are seldom saved over winter by our humbler amateurs. No facility is at hand to accomplish this. The Verbena is impatient of cold, or at least will not withstand a few degrees of frost, while it requires air and light to keep it in even medium health during the winter. An equable temperature, with light and air in quantity, can not be easily secured for it in the dwelling-house window or upper room,—the only conservatory to which our cottagers can turn for protection for their tender favorites.

The Verbena is peculiarly adapted for purposes of decoration in our little city lots, from the rapid growth it makes if at all carefully planted,—producing on poor soils a profusion of its dazzling trusses of flower, sustaining its vigor under the burning rays of the sun if a little mulching is spread around the plant at the root, and not liable to suffer much from extreme wet if the weather is moderately warm.

In addition to the Verbena, now the most common and cheapest of bedding out plants, there are Salvias, Geraniums, Phloxes, Pansies, Chrysanthemums, Daisies, Lantanas, Cupheas, Nierembergia, Ageratum, Bouvardia, and many other families, each containing many distinct species. These do not include Annuals; that is to say, flowers, the seed of which, when sown, vegetate, bloom, and ripen their seed during the course of one year. Bedding out plants are those which may be cultivated in the green house, propagated from cuttings, divisions of the root, or from seed, which generally require more than one season to produce flowers from the time of sowing. Some of the most popular and choice species are, properly speaking, hot house plants; that is, they require to be kept during the winter in a temperature upwards of 60°, though in the summer season they flourish fully out doors, at least in our ordinary seasons.

Another class are known as herbaceous. These are quite hardy, and are generally propagated by division of the roots. They are by far the most useful for the amateur's garden, as they demand no special treatment and very little care. All plants are termed *herbaceous* which send up from a root-stock stems, expand their foliage, and produce flowers and seeds; then, as the autumn passes into winter, fade and decay,—their roots storing up in their fleshy crowns substance for their support during the dormant season, and in the following spring are again found, as soon as the season opens, bursting forth into leaf and flower. These are our herbaceous plants or herbs, properly so called, and to this division of the vegetable kingdom belong most of our indigenous

herbage, such as Asters, Solidagos, Phloxes, Milkweeds, Grasses, and all such plants as may be observed springing up spontaneously in our fields and thickets, effecting the end of all creation—perpetuating their species—and in winter yielding to annual decay, their roots being proof against the season's vicissitudes.

Of these the PHLOX has become one of the most desirable and showy for the American flower garden, requiring very little care. This showy plant grows up into vigor, and produces a splendid spike of delicate flowers in great variety. The family is divided into the dwarf and tall growing sections. *P. decussata* includes the varieties which generally grow dwarf, and *P. suffruticosa* the tall or half shrubby sort. The Phlox does well in good loamy soil, rather rich, and a selection of about twelve varieties will include those most worthy of notice. Several species are indigenous. One of these, *P. procumbens*, is a beautiful early spring flower, found in dense tufts in our north-western woods, and much planted in little gardens in the vicinity of its native woods. Nothing can be prettier than this trailing herbaceous Phlox.

SALVIAS are as showy as the Phlox is chaste. Their glowing color, tropical aspect, and robust habit, have rendered the *Salvia splendens*, *fulgens*, *azurea*, *leucantha* and others, favorite garden plants.

S. splendens is perhaps the most showy of the family; it is also useful for winter blooming in a warm green house or hot house.

S. patens, both blue and white varieties, is rather tender, and somewhat difficult of cultivation. To produce a good specimen some pains must be taken.

S. Lileana, a light blue species, is very choice, a free bloomer, and easy to manage.

GERANIUMS are so familiarly known to our amateur friends, that a few remarks will suffice. We have frequently aimed at the correction of the vulgar nomenclature which assigns such names as *Fish*, *Waterloo*, *Horse-shoe*, *Nutmeg*, *Apple*, *Lemon-scented*, &c., to the various sorts. The broad-leaved varieties, with great diversity of color and marking, are properly styled *Pelargoniums*. These do not suit for out-door cultivation; so that the scarlet varieties, or old horse-shoe sorts, are more relied upon for bedding plants. Of these there are several choice dwarf varieties. *Tom Thumb* is still good; also, *Frogmore improved*, *Boule de Feu*. *Shrubland Scarlet* is a robust variety. *Brighton Hero*, though not new, is good for garden cultivation. Of newer varieties, there are the rose-colored *Lucea rosea*, *Princess Alice*, &c., and to these have been added several white varieties, the best of which is *Boule de Neige*, or *Snow-ball*. All these do well propagated from cuttings of the soft wood, and grown in a compost of loam, sand, and well rotted manure, with a little leaf mold,—about one part of sand, two of loam, and one of vegetable mold and manure. Of the *Pelargoniums* there is an endless vari-

ety, from lilac to bright crimson and white, and in some almost black, so great is the variety of tints. These require plenty of air, moisture, and rich loamy soil, to produce fair specimens. The strong shoots require to be pinched regularly in the growing season to produce a profusion of flower buds.

Pansies are not so generally cultivated as they might be. Those we generally meet with are deficient in size and form. They require a cool situation in our American climate, somewhat shaded from the strong rays of the sun. In Western New York they bloom profusely from May till October, with the exception of about a month in the middle of summer. The Pansy may be propagated by cuttings, divisions, layers, or seeds. Good seed is not easily procured, as this climate is not favorable to its production. From a packet of choice imported seed many fine flowers may be produced. After their first blooming is exhausted, the plants should be cut down; in the autumn months they will bloom again.

Carnations are still more rare than Pansies. The monthly sorts are, however, cultivated successfully in the vicinity of several of our large cities, and fully repay the florist. They require a stiff sandy or clayey soil, and must be specially protected from extra cold, heat, or moisture. The Carnation is propagated by layers and pipings. The method of layering is similar to that practised with Roses and other ornamental plants, and need not here be specially defined. Pipings or cuttings are not so successful, as the variable climate does not favor them.

Polyanthus is a very favorite flower with those who have become familiar with it. Like the Pansy, it must be treated with a view to avoid the extreme heat of the summer. It is also procured from seeds. In obtaining seeds, of what are called florists' flowers, it is at least necessary, in order to have any chance of a good result, that the seeds should be gathered from choice sorts carefully saved.

Calceolarias are not much cultivated, as they are too fragile and tender for promiscuous flower gardens. When special attention is bestowed on them, they are very pleasing and showy. The shrubby varieties, however, are more adapted to our purposes than the herbaceous section, and the former are much cultivated in the more temperate parts of the States. The seeds must be sown on a very fine sandy loam, very lightly covered, watered with care from a fine-rosed watering-pot, shaded from the strong rays of the sun, and preserved from damp, or cold currents of air. When sufficiently large to be caught in the finger and thumb the seedlings should be transplanted from the seed pan, and removed gradually from pot to pot, never permitting them to stop growing till in a size fit for flowering them,—about a six inch size. If the roots are permitted to get entangled, the growth stops, and the flower stems are prematurely thrown up. To produce good specimens

strong sandy loam is requisite, well mixed and rotted manure, or night soil is very good for all such rank-growing herbaceous plants.

We have necessarily omitted many topics we designed to elucidate, and have not noticed many prominent and popular flowers. Should the present issue meet with a favorable reception, the publisher may enlarge the next, and enter more fully into the several departments of ornamental gardening.

In conclusion, we have to add that tender annuals should be sown in boxes or pots, and placed in a hot-bed early in March, and kept in a frame for a few weeks till hardened, then they may be transferred to the open ground at the approach of warm spring weather. Sown in the borders they seldom give satisfaction, unless sown in a sandy soil, and in a very warm situation.

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1857.

PREFACE.

The favorable reception which the first number of the Rural Annual met with, renders an apology unnecessary for the appearance of the second. The present issue has been prepared in accordance with the original design, namely — to furnish a brief record, annually, of the progress made in the several branches of Rural Economy. The various articles have been prepared by gentlemen of acknowledged skill and experience in their several departments, whose names will be found attached to their respective contributions. The first number contained many valuable articles, to which we beg leave to refer the reader, — our object being to make the Annual a continuous and reliable record of all that is worthy of note, in the Farm and Garden, from year to year.

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RURAL ANNUAL AND HORTICULTURAL DIRECTORY

FOR 1856.

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THE

RURAL ANNUAL

AND

HORTICULTURAL DIRECTORY

RURAL ARCHITECTURE.

BY HOWARD DANIELS, ARCHITECT, NEW YORK.

THE principles of Architecture are recognized, though somewhat indefinitely, by all intelligent minds, but they are only clearly and distinctly understood by those who have studied the character and expression of each mode of structure, and have traced the several impressions of beauty, or utility to their proper origin. We accept, in this instance, the ordinary meaning of the term *architecture*, as we have neither space nor inclination to indulge in etymological disquisitions, and whether it was applied originally to mere workers in wood, or mere workers in stone, matters very little to the main purpose of our present remarks. It is sufficient, that the law of mind which gave birth to the simple forms of the triangle, the circle, and the square, gave to man the principles of Architecture, and suggested the form and proportions of the first structure that he erected for his convenience or pleasure — however rude may have been its primitive appearance.

The first aim of man in his structural efforts must, it is fair to assume, have been directed to *utility* — a principle which varies with all the accidental circumstances of climate, materials and customs; and whenever ornaments began to be an object of attention, his taste must have pursued the same track which utility had already marked out. To this circumstance may be attributed the distinct character which Architecture has assumed in different countries, and which has enabled it to preserve, throughout its rise, progress and decline, the peculiar forms which it originally received. The principle of utility, then, has been rarely sacrificed to that of ornament; and the main purpose of the

structures of antiquity may be clearly traced, though beauty has occasionally stepped in to perplex "with her spiritual charm" its simple form. It was not, however, till utility had been secured, that other motives were suffered to intrude themselves, and the considerations of magnificence and beauty were admitted to have a share with those of convenience. Thus, what was at first calculated barely to supply the wants of mankind, became by degrees subservient to higher purposes, and even added a lustre to the most polished conditions of the world.

An art, however, which unites usefulness with beauty, and addresses itself to the wants as well as to the tastes of mankind, must naturally be influenced by their moral and physical habits, and by the varied modes of existence which mark their progress towards civilization. Under the influence of these peculiar combinations, a constant state of transition has been the essential condition of Architecture as an art; and both in ancient and modern times, it has frequently diverged from a common point of departure to the most distant extremes, and even into the most opposite principles of taste.

Yet throughout all these modifications, the Architecture of a country has generally preserved its leading forms and the prime features of its character; and though there may be a wide difference between the primitive and the most polished structures of a people, as regards ornament and beauty, there is none in principle, — for the earliest Temple of Greece, that of Apollo at Delphi, which Pausarias informs us resembled a hut or cabin, was as strictly the form of a geometric solid, as the Parthenon at Athens, with all its exquisite finish and its finely proportioned parts.

In all ages of the world, then, of which we have any architectural remains, there may be traced a distinct character of art, which sprang out of its physical necessities, its social relations, and its moral requirements; and when any one people has been the copyist of another—has merely contented itself with transferring its structural forms — there has invariably arisen an incongruity of purpose: for the idea of which the original is an outward and active representation, is no longer present, but has given place to one that has little or no affinity with it.

The fruits of the many violations of this noble art may be seen in almost every direction; for there is scarcely a structure of any magnitude or importance in our whole country, that will bear the scrutiny and test of a cultivated and refined taste. There is too frequently an unmeaningness in the superfluities, and a lack of meaning in the necessaries; the character of the ornamental having little affinity with the useful, and both at times inversely proportioned. Fitness of purpose, unity of outline, and harmony of detail, material and construction — the chief principles upon which all true Architecture is based — are seldom realized in our country, and as a consequence, the convenience of arrangement and consistency of decoration seldom attained.

Every building, of whatever magnitude, ought to express its peculiar

purpose; and to this end the architect should study attentively even the minutest details. The first object to be secured, is the designed utility of the structure: the next, suitable arrangement and consistent ornament; and if these be effected, the design will naturally develop its own form and beauty, with scarcely any effort to assist it. It is, moreover, the province of the architect only to render that beautiful which is manifestly useful.

From the preceding remarks it follows that the three great objects to be attained in building, whether in a cottage, a villa, or a palace, are *Fitness*, *Purpose*, and *Propriety*. Each of these have their peculiar beauty, the sum of all being the perfection of Architecture. Man, in raising the first structure, had one primary object in view — to secure shelter. This was establishing the first principle of Architecture, and is called the principle of *Fitness*. To mark his progress in civilization, man next impressed a distinct character upon his habitation, expressive of his peculiar condition. Hence the second principle, the expression of *Purpose*. As the beautiful invariably springs from the useful, the finer feelings of man's nature next developed themselves with order, symmetry and proportion, which created naturally the principle of *Propriety*.

It follows necessarily from the preceding observations, that whenever Architecture becomes an active revelation of the mind — whenever the internal spirit of genius assumes an outward development by its aid — it is to all intents and purposes a Fine Art. It also follows, that there may be as true a principle of Fine Arts in a modern town-house as in an ancient temple — in a simple country cottage, as in a magnificent cathedral.

In many instances, both in ancient and comparatively modern times, the conception and execution of great works have been entrusted to the same hands; for, if historical traditions may be relied upon, the designs of the finest temples and statues of ancient Greece were struck, so to speak, at the same intellectual mint, and their execution entrusted to the skill of those who conceived them.

The same remark will apply to Italy, on the revival of Art under the Medicii, when Michael Angelo and Raphael shone with such peculiar lustre in their respective spheres. The first of these great minds was not confined to one single department of Art, but was equally eminent in all; and the last could furnish designs of the highest order of architectural excellence, as well as impress the character of his fine genius upon canvas, or fresco.

If the greatest minds of old, then, could busy themselves in the arrangement and construction of merely subordinate things, surely we moderns can imitate them in this respect.

It is much easier, it may be said, to acquire a knowledge of rules than an insight into principles. True, but the spirit which animated these distinguished minds is by no means extinct, and if it is applied with the same diligence as formerly, our Architecture will acquire the same excellence as theirs.

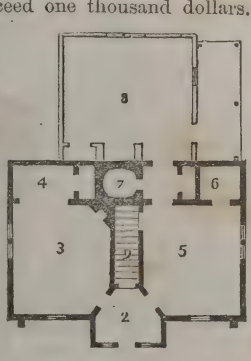
No. 1.—A SMALL FARM-HOUSE.

(For Floor Plans and Description see Page 13.)

No. 1.—A SMALL FARM HOUSE.

This design was made for Mr. JOSEPH GATES, of Elkhorn, Wis., who had procured the materials for a house 22 by 32 feet, before ordering the plans, and who desired that the cost, in addition to what he had already done, should not exceed one thousand dollars. A small addition was made for an entrance; the projection so added could be best roofed with a gable; which, with a future addition indicated in the plan, completes the design as shown in the perspective view.

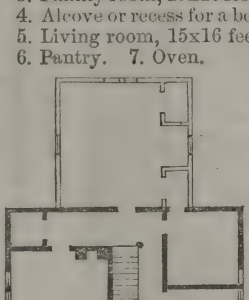
The exterior covered with clapboards; a shingle roof, projecting two feet six inches, with truncated gables; simple canopy caps over the end windows of the first story, with roof of matched boards having the joints battened. A rustic porch, covered by a vine or a simple roof, shelters the entrance door.



Ground Floor.

FIRST STORY.

1. Rustic porch covered by a vine.
2. Entrance or vestibule.
3. Family room, 15x16 feet, with fireplace.
4. Alcove or recess for a bed, with a closet.
5. Living room, 15x16 feet.
6. Pantry. 7. Oven.


Chamber Floor

8. Shows how a kitchen may be added, with a rustic veranda on the side.

To this kitchen may be added a scullery, dairy, &c., as occasion requires.

9. Staircase, with cellar stairs underneath.

SECOND STORY.

The stair landing is over the oven; a large closet over 4, between which and the chimney is a door opening into a large chamber over 3. A passage next the stairs leads to a small bed-room over 2, and a partition divides the space over 5 into two chambers.

When the kitchen wing is added, the second story will furnish two more chambers, both of which may be entered from the stair landing, by doors each side of the kitchen chimney. This arrangement supposes the chamber divided by a partition running from the chimney to the rear end of the room.

No. 2.—A COTTAGE.

This Cottage was built at Dale Cemetery, Sing Sing, N. Y., for the

NO. 2.—A COTTAGE.

(See Plans and Description on Pages 13 and 15.)

Superintendent's residence, and cost $1,250. The exterior is covered with mill-worked pine flooring in horizontal courses; the roof is covered with tin, and projects two feet; the window architraves are two inches thick, and a small hexagonal porch shelters the front door.

The perspective view shows the exact appearance of the building as it now exists.

Ground Floor. Chamber Floor.

First Story. — 1. Living Room, 15 by 18 feet, and warmed by a stove, the pipe of which passes through the room above, and then enters into a chimney standing over the hall door to 5. 2 is used as a dining-room in summer, and in winter as kitchen and dining-room; is 18 by 22 feet, has a staircase leading to the second story, and another under it to the basement, and a sink in the corner. 3. Store-room and pantry. 4. Parlor, 15 by 18 feet. A small porch shelters the front door, and an entry or vestibule six feet square affords access to all the rooms.

Second Story. — In the second story are two large (5 & 8) and two small chambers, (6 & 7,) with an abundance of closets.

Basement Story. — The west side of the basement is entirely out of the ground; a back door and entry occupy the space under 3, a kitchen under 2, fuel room under 4, and cellar under 1.

This design affords the maximum amount of available room, — is compact, convenient, and at the same time embodies considerable variety and elegance in the forms of its rooms and exterior.

A COTTAGE IN THE ENGLISH HALF-TIMBERED STYLE.

This design was made to suit the last described plans, and is known in England as the "half-timbered style." This style grew out of, or originated in, the materials prevalent in certain portions of England centuries ago, and consists of a strong and skillfully constructed timber frame, filled in with brick. Sometimes geometrical figures were formed

A COTTAGE IN THE ENGLISH HALF-TIMBERED STYLE.

(Floor Plans same as for Design No. 2.)

in bricks of different colors — as red, black and yellow. When good bricks were scarce, or too expensive, an inferior article was used, and the exterior plastered, and dashed over with sand, gravel, and a colored wash — technically called "slap dash."

The corbeled projections of the second stories, the high pitched slate or tile roofs in geometrical patterns, and the quaintly carved verge boards of solid oak, make up the peculiar and characteristic features of this substantial and really beautiful style.

No. 3.—COTTAGE IN THE ENGLISH STYLE.

The perspective view shows the features usually introduced into cottages in this style. The walls are always of stone or brick; the wooden features strong and solid · making up a really substantial and beautiful structure.

This design affords room for a small family, and may receive additions of back kitchen, dairy, &c., to the present kitchen. The cost will vary from $2,000 to $3,000.

First Story. — 1. The parlor, 16 by 17 feet, having an angular bay window looking into the lawn, and a garden porch, (4,) with a French window looking into the flower garden. 2. Living room, 16 by 17 feet, and has an angular bay window looking into the lawn, and a closet (6). 3. Front porch, with seats, and glazed sashes and an outside door for winter use. 5. Staircase, from the landing of which a short flight leads to the rear chambers. 6. Closet for china, &c. 7. Store room or servants' room, 6 by 7 feet. 8. Kitchen, 16 by 16 feet, with an ample supply of closets, &c. 9. Veranda, or may be used as a conservatory.

Ground Floor.

Second Story. — In the second story are three large chambers, with closets; also, one large linen closet.

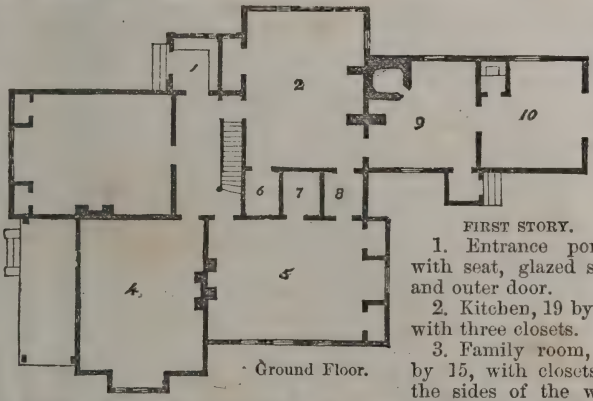
The walls of this cottage should be of brick or stone; the roof of slate or thick shingles cut in patterns; the verge boards and other ornamental wood work should be thick and strong, and painted a warm drab or buff color.

No. 4. — FARM HOUSE.

This design is supposed to be built of wood, in the usual manner of a timber frame, covered with clapboards or mill-worked flooring, and

No. 3.—A COTTAGE IN THE ENGLISH STYLE.

covered with a shingle roof. The chief idea in it is to get as much variety of outline as possible, with as many conveniences and comforts as are needed, at a moderate expense.



Ground Floor.

FIRST STORY.

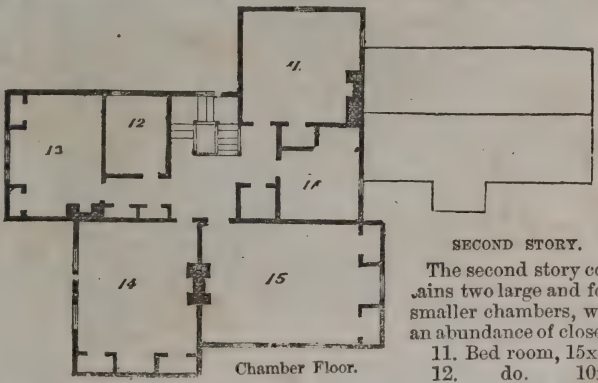
1. Entrance porch, with seat, glazed sash and outer door.

2. Kitchen, 19 by 15, with three closets.

3. Family room, 19 by 15, with closets at the sides of the window, forming a bay on the inside. 4. Parlor, 19 by 15, with a bay window at the end, and two French windows at the side, opening on a veranda.

5. Dining room, 19 by 15, with ample closets; the side windows are shaded by a canopy roof. 6, 7 & 8. Closets.

9. Wash room or back kitchen. 10. Wood house or dairy.



Chamber Floor.

SECOND STORY.

The second story contains two large and four smaller chambers, with an abundance of closets.

11. Bed room, 15x13. 12. do. 10x8. 13. do. 15x10. 14. do. 16x15. 15. do. 19x15. Estimate, $3,000.

No. 4.—A FARM-HOUSE

(For Floor Plans and Description see Pages 17 and 19.

No. 5.—COUNTRY VILLA.

In this design is an attempt to embody the qualities of solidity and durability possessed by the half-timbered houses of Europe, in a simple style, that is appropriate to and somewhat characteristic of a republican people.

The frame should be of seasoned timber, eight inches square, skillfully framed together, and filled in with brickwork four inches thick.

The window caps and sills, the balcony, porch, cornice, &c., should all be of solid timber, and show their form in all its details perfectly.

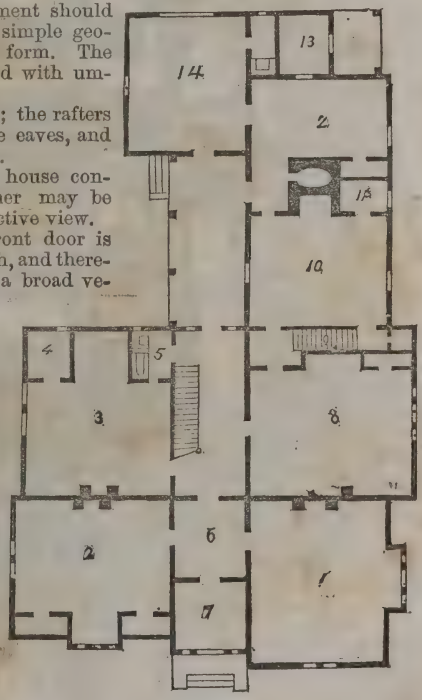
The brickwork to set back two inches, and if bricks of two colors—as red and yellow, or drab—can be procured, each compartment should be constructed in some simple geometrical or ornamental form. The timber should be colored with umber, or a dark drab.

The roof to be tinned; the rafters to show distinctly at the eaves, and the purlins at the gables.

The appearance of a house constructed in this manner may be judged of by the perspective view.

In this design the front door is supposed to face the north, and therefore there is no need of a broad veranda to exclude the summer's sun.

This plan is designed to accommodate a wealthy farmer, or retired merchant or tradesman, whose family require more of the elegancies of life than farmers usually do.



Ground Floor.

FIRST STORY.

1. Parlor, 20.6x16.6, with bay window looking west.

2. Sitting-room, 14x 20, with closets each side of the front window, and forming a deep bay on the inside. These closets may be used for books, instruments, &c.; or if desired, they might be fitted up with glazed doors, and one used as a Library and the other as a Cabinet.

No. 5.—A COUNTRY VILLA.

(For Floor Plans and Description see Pages 21 and 23.)

3. Family room, 19x19, with a large alcove or recess for a bed, a large closet, (4,) and a Bath room (5.) 6. Hall. 7. Vestibule.

8. Dining-room, 18x15, with a side bed recess; on the left is a china closet; on the right a lobby leading to the Kitchen, cellar stairs and Bath.

9. Back stairs, which land over the lobby, on the same level as the landing in the principal staircase.

10. Kitchen, 15 x 16, with a large pantry (11.)

12. Scullery.

13. Milkhouse, larder or dairy.

14. Woodhouse.

A broad porch on the east shelters the kitchen from the morning sun.

SECOND STORY.

The second story contains four large and as many small chambers, with plenty of closets.

15, 17, 19, 20, 21, 23, 24, are bed-rooms.

16. Tower room.

18. Hall.

22. Linen closet.

A narrow staircase in 16 leads to the upper story of the Campanile, which is supposed to command fine distant views.

Chamber Floor

The estimate is $6,000 to $8,000.

No. 6.—SUBURBAN VILLA.

This Villa was designed for the country residence of a New York merchant. The site is a gentle slope to the east, with magnificent views of New York, Brooklyn, Long Island, the Harbor, Bay and Narrows, and is surrounded with a rich growth of trees.

This is another attempt at designing a house to be built of timbers and brick, in a real, truthful and living style.

No. 6.—A SUBURBAN VILLA.

(For Floor Plans and Description see Pages 23, 25 and 26.)

The perspective view shows the appearance as viewed from the north-east.

Ground Floor.

First Story. — 1. The Carriage Porch. 2. Vestibule. 3. Hall, 10 by 31.6.

4. Library, 18.6 by 18.6, the east side opening on a Terrace.

5. Dining room, 15.6 by 19, with a side-board recess and a china closet on the right.

6. Pantry. 7. Waiting and dishing pantry.

8. Principal staircase.

9. Parlor, 18.6 by 26.6, with bay window at the east end looking into the flower garden and lawn.

The south side is sheltered by a broad veranda, (17,) which is enclosed with glass in winter.

10. Tower Porch.

11. Family room, 18.6 by 18, with closets each side of the windows; a Dressing room (12); Bath room (13); and a passage to Dining room and Kitchen.

14. Kitchen, 16.6 by 20.

15. Washroom, 16.6 by 12. 16. Woodhouse, &c. 18. Terrace.

Second Story. — The second story contains four large and four ordinary sized chambers, with an ample supply of closets, a Bath Room, Water Closet, &c., as follows:

1. Hall Bed room, 12 by 10. 2. Hall, 27 by 10.

3. Bed room, 19 by 18. 4. Bed room, 19 by 16. 5. Bed room 17 by 15. 6. Bed room, 12 by 9.

7. Dressing room. 8. Bed room, 19 by 18. 9. Stairs. 10. Dressing room. 11. Bath room. 12. Linen closet.
13. Servants' room, 18 by 18. 14. do., 16 by 12 15. Back stairs.

Chamber Floor.

This Villa will cost $12,000, erected in a plain and substantial manner, and $15,000 if built of brick in the best manner.

PAINTING GARDEN SEATS, &c.—Connoisseurs seem to regard the painting of rustic vases, &c., pea-green, and placing them amid the inimitable greens of nature, as not only far from ornamental, but a "dismal joke," so pitiful is the contrast. Mrs. LOUDON and others, who agree that stone is the naturally suggested variety with terraces and moss, advise that all such outside appurtenances be painted—not green, or even wood colors, but always *stone* colors, with silver sand sprinkled freely over them while the paint is wet (as is done for fences). This is when they are at all architectural in construction,—as twisted boughs, &c., are better left entirely alone. though even these are sometimes seen defaced by paint.

CLIPPING BOX.—Some gardeners clip Box edgings in September; but when done so late in the season, the lower part of the stalks are made bare, and the *weaker plants* are very likely to be killed. And besides, they will retain the marks of the shears till the following May. If cut in July and well watered, a second shoot will start and grow half an inch before winter, entirely obliterating all marks of the cutting. As they are evergreen, it is desirable to have them in their best trim when deciduous shrubs are leafless.

LAYING OUT A GARDEN AND ORNAMENTAL GROUNDS.

We are not unfrequently asked to give a plan for laying out a garden and ornamental grounds for a suburban or village residence. "Supposing," said a friend, "you had a piece of land, about an acre and a half to two acres in extent, on which you were about to build, how would you lay it out?--what ornamental and fruit trees would you plant, and where; how should the kitchen garden be formed, and where should the beds of small fruits and vegetables be placed?" In reply, we present the sketch on the following page. We cannot enter into the full details of carrying out such a plan, but will endeavor to give a few brief hints that may not be unacceptable.

There are but few soils that do not need underdraining. This is the first thing to be attended to. Then subsoil-plow or trench the soil two feet deep, and make it rich and mellow. Then surround the garden with a hedge—Nothing adds so much to the appearance of a place as a properly managed hedge. It should be planted in a broad and deep border, free from the shade of any trees whatever, and kept constantly clean and mellow for a course of years, until the fence is perfected. (See article on Hedges on another page.) The hedge may be formed of Osage Orange—which is of all other plants the best safeguard against intruders; or if the location will allow, of American Arborvitæ, which is the most beautiful, easily procured, and most tractable evergreen screen. Buckthorn or Privet bears shearing admirably well, and the first eventually makes a good defence. Three-thorn Acacia also makes a fine fence.

The ground next to the hedges may be cropped with garden vegetables, but should not be planted with trees, vines, or bushes,—any of which detract from the growth and beauty of the hedge, and are themselves broken or injured by the snow-banks which accumulate in such situations.

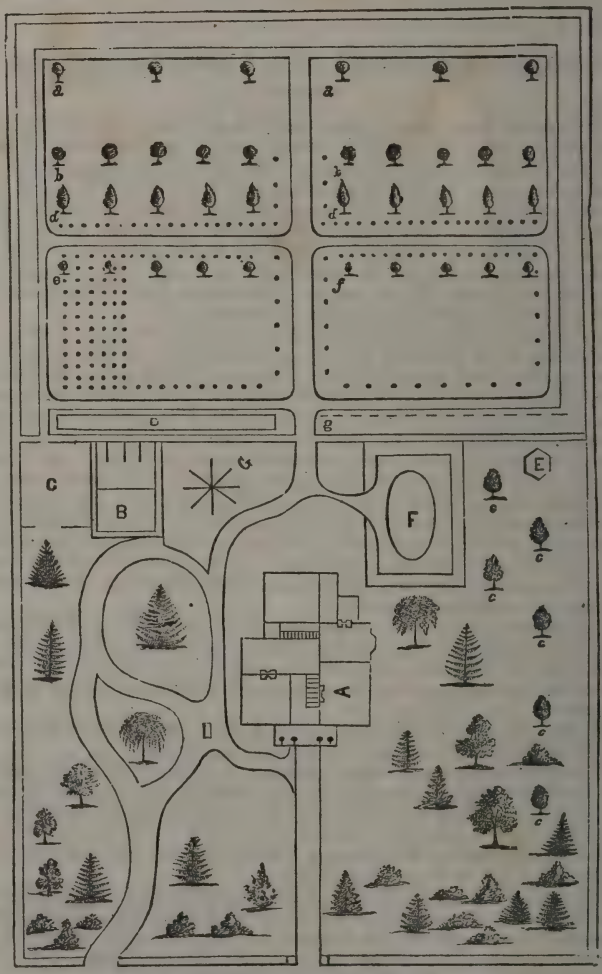
In the rear of the garden are located the larger fruit trees, among which potatoes and corn may be annually produced.

The central walk is furnished with a row of dwarf pears (on quince stocks) on each side. Dwarf cherry and dwarf apple trees, currants and gooseberries, also fill the borders of the side and cross walks. Raspberries occupy a portion of one of the squares. Blackberries can be added, if desirable. Strawberries will remain but two or three years in one place, so we do not locate them.

The grape trellis (G.) should be so situated as to have all the advantage which hot sun can give to ripen off the fruit, and the vines planted on a rich border, not burthened with much other vegetation.

The asparagus (D.) and pie-plant should also be planted where the exposure to the sun is good, and high manuring easy.

The forepart of the sketch will need little explanation. A, is the



PLAN FOR LAYING OUT A SMALL GARDEN.

house; B, the barn; C, barn-yard; D, asparagus bed; E, arbor; F, flower garden; G, clothes-horse.

The location of the flower garden, arbor, and walks, the different varieties of trees for ornament, and the general style of the ornamental grounds, will of course vary much according to the means and tastes of the proprietors; but our own preference is for thick planting about the outside boundaries, and a fine lawn of moderate size, well kept, in the immediate vicinity of the house, with such thin planting near the building as will show the entire forms and give space for the perfect development of some beautiful evergreen and weeping deciduous trees.

We are not in favor of having fruit trees on the ornamental grounds, but where the garden is small, it is sometimes allowable. Of all fruit trees, perhaps the cherry is best for this purpose. In the sketch we place six standard cherry trees, (*c*,) to the right of the house, on the lawn. They should be about thirty-two feet apart. We would recommend one each of the following varieties: Mayduke, Governor Wood, Knight's Early Black, Yellow Spanish, Belle Magnifique, and Downer's Late.

In the kitchen garden the following trees and small fruits may be planted, leaving considerable room to spare for vegetables, and for the planting of such other fruits as the peculiar taste of the owner may require.

a. Six Standard Apple Trees, 32 feet apart, viz: 1 Early Harvest, 1 Early Strawberry, 1 Early Joe, 1 Porter, 1 Gravenstein, 1 Fall Pippin.

b. Ten Standard Peach Trees, 16 feet apart, viz: 2 Early York, 2 Crawford's Early, 2 George IV., 2 Oldmixon Free, 1 Oldmixon Cling, 1 Red Cheek Melocoton.

d. Ten Standard Pears, 16 feet apart, viz: 1 Rostiezer, 1 Bartlett, 1 Tyson, 1 Flemish Beauty, 1 Sheldon, 1 Beurre Giffard, 1 White Doyenne, 2 Lawrence, 1 Winter Nelis.

e. Five Plum Trees, 16 feet apart, viz: 1 Washington, 1 McLaughlin, 1 Monroe, 1 Green Gage, 1 Smith's Orleans.

f. Five Dwarf Cherry, 8 feet apart, viz: 1 Belle d'Orleans, 1 Early Purple, 1 Coe's Transparent, 1 Late Duke, 1 Early Richmond.

g. Twelve Grape Vines, 8 feet apart, viz: 4 Isabella, 4 Diana, 1 Concord, 1 Clinton, 2 Catawba.

Seventy-two hills of Raspberries, 4 feet apart, viz: 20 Fastollf, 20 Brinkle's Orange, 20 Red Antwerp, 12 Native Black Cap. These may be planted on the left of the lower square, as shown by the dots.

Thirty-six Currants, 4 feet apart, viz: 12 White Grape, 12 Red Dutch, 6 Cherry (or Black Naples,) 6 Victoria.

Eighteen Gooseberries, 4 feet apart, viz: 4 Houghton's Seedling, 4 White Smith, 4 Red Warrington, 4 Crown Bob, 2 Early Sulphur.

Four Orange Quinces.

Eight Dwarf Apples, 8 feet apart, viz: 2 Red Astrachan, 1 Keswick Codlin, 1 Hawley, 1 Primate, 1 Late Strawberry, 2 Belmont.

Twenty Dwarf Pear Trees, 8 feet apart, viz: 1 Doyenne d'Ete, 1 Brandywine, 1 Summer Franc Real, 1 Beurre Giffard, 2 White Doy-

enne, 2 Duchess d'Angouleme, 1 Beurre d'Anjou, 1 Beurre Diel, 2 Easter Beurre, 2 Vicar of Winkfield, 1 Glout Morceau, 2 Louise Bonne de Jeersy, 1 Urbaniste, 1 Jalousie de Fontenay, 1 Belle Lucrative.

Twelve Rhubarb, viz: 4 Downing's Colossal, 1 Cahoon's Seedling, 4 Early, 1 Giant, 2 Victoria.

Six hundred Strawberry Plants, viz: 100 Hovey's Seedling, 100 L. E. Scarlet, 100 Burr's New Pine, 100 Hooker, 100 Walker, 100 Hudson.

CULTIVATION OF SMALL FRUITS.

WRITTEN FOR THE RURAL ANNUAL, BY H. E. HOOKER.

The smaller fruits, consisting of the Strawberry, the Raspberry, the Gooseberry, and the Currant—and to which we may add the Blackberry—have been held in great esteem by many persons for a long time; but it cannot be said that their cultivation has become very general, or well understood. The prices at which some of them are sold indicates how highly they are prized, and their scarcity would lead us to suppose that it is difficult to raise them. Certainly we cannot prize too highly the delicious Strawberry and Raspberry, nor make up our minds to do without the splendid Lawton Blackberry.

There is a very common, but erroneous, opinion prevailing, that, with the exception of the Currant, these fruits are of difficult and uncertain cultivation; but quite the opposite is the case. There are no *surer* fruits than the whole class of small fruits, and none which have fewer enemies. That they are not so difficult of cultivation as to deter any man of ordinary skill and diligence from undertaking to have them, we shall easily demonstrate. There is, perhaps, no class of fruit-raisers whose annual profits are so great per acre, as the men who cultivate berries for the markets of our cities and larger towns; yet a visit to any of these establisments will satisfy the observing man that no extraordinary skill is exercised, nor remarkable attention bestowed. Nothing is done, nor needed, but what every diligent man may do, who knows how—and every man who can read may know. It should be remembered, however, that small fruits need *early* and *constant* attention. Their lives are short, but the returns are immediate and very bountiful. They never establish themselves, like a tree, deep in the earth, and are therefore more sensitive to good or bad treatment; they cannot so well bear neglect, but will the more promptly respond to careful attention.

For the successful culture of small fruits, as well as of the larger ones, a deep, rich, and well drained soil is necessary; especially is it desirable to secure a location where the supply of moisture is abundant. Some soils are far more easily affected by drought than others, and from causes which are not readily explained. For instance, a sandy soil is

generally considered dry; and yet it seems almost impossible for drought to destroy vegetation upon a sandy soil which is kept mellow by cultivation. Moisture may always be found within three inches of the surface in such situations, during the most protracted dry weather; not to be sure in sufficient quantity to secure good growth, but crops seldom perish, as they will upon a firm clay which could not be plowed early in the season because of wet. Again, springy situations become dryest of all, as soon as the supply from the reservoirs ceases; and they are, therefore, totally unfit to supply moisture at the time it is most needed. It is well known that for a long time the supply of water for plants must come *up* from the deep and hidden places of the earth: the constant evaporation from the earth's surface, and from the leaves of plants which have received their supply from the soil, is so great that unless there be some provisiou for raising it from *below*, all vegetation must cease during a drought such as is annually experienced.

That there is such provision is evident; and whether it be effected by capillary attraction, as some suppose, or by some other law not well understood, we shall not discuss; but all experience shows that this process of nature proceeds most readily upon soils made mellow to a considerable depth, and which are at the same time so well underdrained that water escapes readily *downward* to the depth of several feet; and, as a rule, the deeper the natural drainage, the better the supply of permanent moisture. The mechanical construction of the surface will greatly modify the action of this law; and thus we find that a soil too close and firm fails, as also does one too loose and porous—as are some mucky or peaty soils, whilst what are commonly called strong loams, if lying upon a subsoil of gravel or sand, will generally bear drought well.

It is of great importance to be aware of this provision of nature; for many persons sadly fail by looking for a moist situation, instead of one where moisture is sufficient but not superabundant. A really damp situation is not favorable to good fruits. Highly manured soils are also better prepared to stand drought than others, both from the mechanical effect of the manure upon the soil, and because the salts which abound in all good manures have a strong affinity for moisture,—gathering it fram the atmosphere as well as from the earth.

Having secured the proper requisites of soil and situation, it will be necessary to locate different fruits so that they may be most favorably acted upon by the sun. The effect of the sun's rays is never too powerful for some fruits, while it occasionally injures others. Where it is desirable to produce a berry very early, as in the case of some varieties of Strawberries, the most sunny and exposed places should be devoted to them; whilst the cooler and more shaded situations may be devoted to the Blackberry and the Gooseberry, which are rather shy of sunlight.

If large plantations are to be made, deep plowing and previous high manuring are desirable. Subsoiling in some cases is most beneficial, where the lower soil is firm and does not readily permit the passage of water down or up.

CHOICE OF VARIETIES.

In the choice of varieties of the different species of fruits, care must be taken to secure those which are by their character adapted to the objects had in view in planting: for there are many varieties which are valuable for some purposes, but worthless for others. For instance, the *Early Joe* apple is most delicious as a table apple, and very desirable in every family, but as a market fruit really valueless. On the other hand the *Baldwin* apple, whilst it cannot be ranked as best in flavor, proves unequalled for profit to the grower of apples for sale. It is the same with small fruits. Some not classed as best are very desirable to the planter from some peculiarity,—either the earliness, the lateness, the firmness of flesh, or beauty of color, or size of fruit: any one of these peculiarities, although apparently small items, will decide the entire value of the variety to a planter. So also the value of different sorts will vary exceedingly in different soils and localities. These facts render the compilation of a list for "general cultivation" almost impossible; but we will try to name a few varieties that we think will be found, under ordinary circumstances, as well adapted to the varying soils, uses and locations, as any now known. Cultivators should watch for themselves the value of different varieties of fruits on their own grounds, and enlarge their plantations from those found to be most profitable.

CULTIVATION OF THE STRAWBERRY.

The Strawberry may be grown successfully upon various soils, and should receive varying treatment, according to the nature of the soil and the object had in view. If it is proposed to see how large the specimens can be grown, or how much fruit can be produced upon a given surface, or how early berries can be ripened, or how cheaply a quart can be produced, it will be necessary, in each separate instance, to adapt the variety raised, the soil upon which it is planted, and the amount of manure used, and the method of culture, to the case in hand,—as all these results cannot be secured by the same means.

The principal uses to which Strawberries are put, are for the family and for the market. We shall treat them separately, because it is an open question still, whether the method to be recommended for the family is as profitable for the market gardener as that now pursued by most of our practical cultivators. The amount produced upon an acre is much greater, and the specimens larger, but the difficulty of suitably preparing a large piece of land, and the greater amount of hand labor required in the former case, have thus far deterred our cultivators from attempting it upon a great scale.

Strawberries for the family should be raised in the following manner. Having selected a piece of dry (that is, well drained) soil—not very sandy, if it can be avoided, but well exposed to the sun, and of a character to resist drought,—dig deeply, trenching in a good quantity of old stable manure, and pulverize the soil thoroughly. Be careful to

do this when the soil is dry enough to crumble finely, even if it becomes necessary, upon a clay soil, to incur a short delay. Nothing is gained by working a stiff soil very soon after a wet time.

Spring is the proper season for transplanting; which may be done any time in April, or even as late as the last of May, if the weather is damp. The earlier the better, however. Planting in August or September is quite common, but the young plants are not strong enough, or do not become so well rooted after that time, as to produce a full crop the following season, and commonly many are lost in transplanting at a season when we are likely to have a hot sun and a dry earth. It is true that under very favorable circumstances, they occasionally endure the following winter well, and produce a partial crop the next June. Plants set in April, on the contrary, will become very strong and vigorous before they have to produce fruit or endure the frosts of winter.

The plants should be set in rows two and one-half feet apart; plants one foot distant from each other in the row, where the smaller growing kinds are cultivated, and one foot six inches in the row if large growing kinds are desired.

During the summer, the ground should be kept clean and mellow; remove all the runners before they take root, except such as are required for new beds the following spring. The plants required for new beds may be transplanted into a small bed by themselves, as fast as they become well rooted, and there kept for use next April. About the middle or last of November, the whole bed should receive a slight covering of long stable manure, leaves, or tan-bark. If the plants have grown very strongly, manure will not be necessary, and leaves will form the best covering; but either will commonly answer every purpose.

Early in April, the covering should be removed from the plants. If tan-bark is used, it will only be necessary to see that the crowns are uncovered; and with either tan or leaves, the winter covering may all remain between the rows for mulching, to shade the ground during drought, and to keep the fruit clean whilst ripening. If manure is used, it is best to fork in all but the coarsest of it, and about the first of June cover the ground between the rows carefully with fresh mown grass, tan-bark, or cut-straw, to keep the fruit perfectly clean.

Beds made in the above manner will continue in good bearing two or three seasons, producing immense crops of the finest berries. The method may seem somewhat expensive, but the satisfaction will be so great to the amateur that he should not hesitate to adopt it; whilst on the score of economy it is, as we have said, an open question whether the increase in quality and quantity will not more than repay the increased labor.

The second method, and the one most generally adopted by market cultivators, is equally practicable in the garden of the farmer or laborer, and in the field where a horse and cultivator can be used between the rows. It is as follows: In April or May, set young plants of the pre-

vious season's growth, in rows three and a half or four feet apart, the plants one foot to one foot six inches distant from each other in the rows. The large space between the rows must be kept perfectly clean and mellow, either with the hoe or cultivator. If the season be favorable, about the first of August the young runners will become quite numerous, and the season of weeds being pretty much past, the cultivator may be discontinued, and the runners allowed to spread rapidly and root freely in the mellow earth. A narrow space, however, may be kept open with profit, between each row, to serve as an alley in gathering the fruit. This can be done by contracting the cultivator, so as not to cover more than eighteen inches or two feet. Before the close of the season, the ground will be pretty well filled up with young plants, which the following season will produce abundantly, and because of their great number, so cover the earth with leaves that no mulching is required to keep the fruit clean when ripening.

No care is bestowed upon the beds during winter, as there are commonly plants enough, so that if a few were killed by frost they would scarcely be missed. It is also not desirable to produce a very great growth of vines, lest the fruit be not sufficiently exposed to the sun. In very rich land, the plants sometimes multiply so rapidly that the bed is too thick, causing the loss of nearly all the fruit. This must be watched, and if necessary a part of the plants taken out.

By this method, a fine crop is usually procured the first season, and in some cases, though not always, the next year's crop is also a good one. In general the bed becomes too much crowded, the old plants fail, and the young ones are weak. It is best to depend upon making a new bed every year to take the place of the old one, spading that under as soon as the fruit is gathered.

In all strawberry plantations, it is necessary to provide against the *barren* beds which are sometimes seen in the hands of men who do not understand the sexual character of the Strawberry blossom.

Some varieties of the Strawberry produce blossoms which are not perfect in all parts. Varieties which have no stamens, (or in other words, that portion of the flower which bears the pollen or dust, and which, falling upon the pistil, causes it to perfect seed and produce fruit,) must be planted in the immediate vicinity of, or adjoining bed to one which has perfect flowers. In such a situation, the pollen from the other variety will fertilize both its own blossoms and those of its neighbor. At first sight it seems incredible that the dust from these perfect blossoms should so pervade the atmosphere, as to reach the obscure blossoms and hidden parts of an adjoining bed; but the fact is perfectly demonstrated every season, and can easily be seen by planting a hill of Hovey's Seedling, or some other pistillate variety, at a distance from any other sort. We have seen large plantations, which had been perfectly destitute of good berries from this cause, restored to abundant fruitfulness by planting alongside of them a bed of Large Early Scarlet —a variety having perfect flowers. To assist the novice, we give an engraving of the different flowers, which are very readily understood

when once observed. The number and size of stamens varies greatly, but in those called pistillate they are never prominent enough to be observed without a very critical examination.

Figs. 1 and 2 represent the usual appearance of the staminate and pistillate flowers; and figs. 3 and 4, magnified portions of the same, fig. 3 exhibiting a part of the flower of the Large Early Scarlet, and fig. 4 the same of Hovey's Seedling; *a* being the stamens, and *b* the pistils. By the use of a microscope it will be found that the former is abundantly supplied with pollen or fertilizing dust, while the latter is nearly or totally destitute. Hence Hovey's Seedling or any

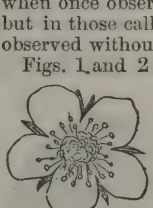


Fig. 1.
Staminate.

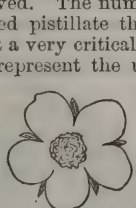


Fig. 2.
Pistillate.

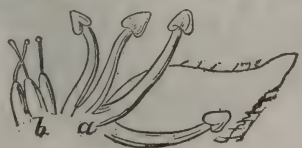


Fig. 3.
Staminate Flower, Magnified.

Fig. 4.
Pistillate Flower, Magnified.

other pistillate variety, can never, or but very imperfectly, fertilize its own flowers, and the impregnation must be derived from a staminate sort.

It is only necessary to plant a small proportion of staminate plants, (if not desirable to do so for other reasons,) in order to secure perfect fruit upon the pistillates: one row of perfect flowers to five of imperfect ones is sufficient. Beds twelve or fifteen feet wide, consisting of pistillate plants, will be fertilized by a bed of staminates five feet wide running alongside and parallel to it.

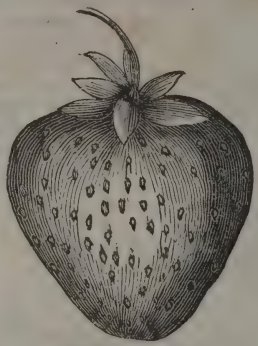
Care should always be taken that two varieties do not become mixed by the spreading of the runners. Some varieties, and particularly the staminate, are much stronger growers than others, and if allowed will soon overpower the weak growers, and perhaps cause you to lose a most desirable sort entirely. As a general thing, pistillate sorts are very much inclined to fruitfulness, and will, if well fertilized, give more abundant crops than the other class; but the necessity for care in planting, and for the presence of a second sort to secure fruit, will eventually cause them to fall into disrepute, and the most productive of the staminates to replace them. At present we have to rely, for some of our very best berries, upon these female or pistillate sorts.

Varieties of the Strawberry for General Cultivation.—*Burr's New Pine.*—Uniformly of the highest and most exquisite flavor; large, roundish conical, regular in form; color, light orange or pale red; flesh very tender; quite early and a great bearer; plants

hardy. Pistillate. It is an American seedling, originating in Ohio. We give an excellent cut of the berry.

Hovey's Seedling. — This justly celebrated variety was raised in 1836, by C. M. Hovey, of Boston.

The vines are vigorous, hardy,



Burr's New Pine.

Hovey's Seedling.

and usually very productive; fruit very large and beautiful; roundish oval or slightly conical; color a fine scarlet; flesh rather firm, and of fair flavor. Pistillate.

Large Early Scarlet. — This is an American variety, pronounced by the lamented Downing, "the finest of all very early strawberries, a regular, very abundant, and excellent bearer, and indispensable in every garden." Leaves rather broad; flowers perfect and larger than most of its class. Fruit regularly formed, roundish oval; color a handsome bright scarlet; flesh rather tender, of a rich and excellent flavor; seeds deeply imbedded in the flesh. Staminate.

Large Early Scarlet.

Hudson.—A great bearer, extensively cultivated for market in the vicinity of Cincinnati. Size medium; flesh very firm, of a brisk acid flavor; color, rich shining red; roundish oval (with a neck). Pistillate.

Crimson Cone.—Late, vigorous, hardy and productive; fruit of medium size, of a bright scarlet color, firm flesh, of a rich, rather acid flavor. Cultivated extensively near Albany for the New York market. Pistillate.

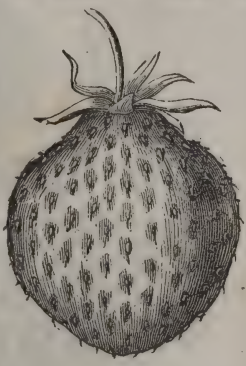
Longworth's Prolific. — Large, vigorous and productive. Staminate.

Walker. — This is a valuable variety, of a very dark red color, good flavor, and very productive. Staminate. See the accompanying engraving.

Walker's Seedling.

Genesee.— Large, roundish, of a beautiful crimson color; of good flavor; plants vigorous, good bearers. Staminate.

Hooker.—Very large, of excellent flavor, dark red color; vines vigorous, hardy and productive. Staminate.



Genesee.

VARIETIES OF STRAWBERRIES FOR MARKETING. — *Large Early Scarlet, Hovey's Seedling*, and *Crimson Cone.*

CULTIVATION OF THE RASPBERRY.

This is truly a most unexceptionable fruit. Nothing can be easier of cultivation, nor more healthful and delicious as an article of food. It comes at a season when we have little else to depend upon for the dessert and the tea-table,—following closely after the Strawberry, and before the Blackberry. Its mild and luscious berries are much to be prized, and will always hold a high place in the estimation of the amateur and the market gardener.

There are many varieties; but the treatment required for each is substantially the same. A few varieties only being so hardy as to require no protection during winter, in other respects the treatment will be the same in all cases.

The Raspberry loves a rich soil, well drained, and kept mellow by spading or forking up every spring and fall. It is possible to cause the plants to run entirely to strong barren canes, by excessive manuring upon a clay soil; but liberal manuring, upon strong loam or sandy soil, is desirable and always to be recommended.

The following is a good method of cultivation: Having your land previously well prepared by spading, &c., lay it out in spaces or squares four feet each way; set the young plants three in each hill, driving also a stake five feet long for each hill of three plants; cut the young plants down to six or twelve inches in height, according to their strength; and as the young canes appear from the bottom, tie them to

Brinkle's Orange Raspberry.

the stakes. Keep the land mellow and free from weeds, and by the end of the season the young canes will have reached the height of four or five feet. No fruit is to be expected the first season; but the young canes now grown up may be relied upon for a crop the following summer,—the fruit being produced on shoots thrown out from the canes of the previous season's growth.

Late in autumn, the young Raspberry canes should be carefully tied to the stakes, and protected with a covering of straw bound about them; or better still, loosened from the stakes and carefully bent down nearly to the ground, and covered slightly with earth. In bending down, it is best to raise a small bank between two hills, and bending the plants from the two towards each other and across the bank, cover both with a little more earth. Thus one bank covers two hills; and by bending them over a slight embankment few canes will be broken, particularly if it be done in damp weather.

The following spring, after winter is fairly over, the canes are to be raised from the earth, and carefully tied, by two good bass-bark bands or strong strings, to the stakes. If the canes are strong, cut them down to about four feet in height. This will give them a neat and regular appearance, and increase the size of the fruit.

Manure should be applied in the fall as a top-dressing, and forked in in the spring; but if not then applied, it should be in the spring when the plants are raised, and the spading or forking attended to.

The plantation is now fairly established, and will continue in full bearing for five or six years; the only cultivation required being such as we have described, and the annual removal in the fall of the old canes which have been the bearing wood of the summer.

There are several methods of training in use, but the difference is more one of fancy than of real importance to the cultivator. Sometimes the plants are set in rows, and tied to bars run along the row; in other instances wire trellises are used; but we consider the stakes preferable, both from their simplicity and from the ease with which the fruit is reached and picked.

Fastolff Raspberry.

Where large plantations are made for marketing, the principal dif-

ference in culture is the introduction of the horse and cultivator, and plow, instead of the spade and hoe.

For market purposes the firmest berries are best, and even these require very great care in picking and transporting, to arrive safely at the consumer's table. A stale Raspberry is worthless, and frequent gathering very necessary, — the weather being always hot while this fruit is ripening off.

Hudson River Antwerp Raspberry.

List of Raspberries for General Cultivation.—*Fastolff.*—A very vigorous and productive variety, of large size and fine flavor. Color, bright, purplish red. Originated at Fastolff Castle, near Yarmouth, England.

Hudson River Antwerp. — A large, handsome berry, fruit very firm in texture, of handsome appearance, and very productive. We annex an engraving.

Brinkle's Orange. — Produced in 1844, from seed, by Dr. Brinckle of Philadelphia. Shoots vigorous, with white spines; leaf irregular; fruit large, ovate, beautiful bright orange color, of excellent flavor and very productive. Probably one of the very best of Dr. Brinkle's excellent seedlings.

List of Raspberries for Marketing.—*Brinkle's Orange*, and *Franconia* — a foreign variety — hardy, vigorous and productive; fruit more firm than Fastolff, large, dark color, and rather acid in flavor; ripening a few days later than Red Antwerp.

CULTIVATION OF THE GOOSEBERRY.

The Gooseberry is not generally considered a fruit to be depended upon in our climate,—mildew commonly depriving the cultivator of his reward. So far as our observation and experience go, we think the loss of fruit can be in a great measure prevented. The mildew, which is so destructive, is not a mould caused by dampness; for a dry and sunny, and especially a sandy situation, seems most liable to its prevalence. There are some varieties, particularly the Houghton Seedling, a small native sort, which will give good fruit with almost any soil or culture; but the largest and finest berries are all from imported or English varieties, and are more or less subject to the mildew. Satisfactory crops will generally be obtained if the following directions are followed:

Secure a piece of cool, rather rich and clayey soil, well drained and deeply cultivated; if partially shaded by large fruit trees or high fences

Houghton's Seedling Gooseberry.

on the south, it will be none the worse. Set plants four feet apart each way. For the first year or two, a crop of small vegetables may be raised

between the rows, but severe cropping should not be allowed. Keep the soil well manured, and under good cultivation; and each autumn, or early spring, thin out the feeble and dead branches, and prune the strong ones severely enough to secure a healthy growth of young wood each season. The ground under each bush should be mulched about three or four inches deep with coarse manure or salt hay—or even fresh cut grass will answer. A thorough drenching with soap suds is also highly beneficial, if applied during the early stages of the growth of the fruit. A little care is necessary to watch for caterpillars, which sometimes attack and strip the bushes of leaves. If taken early, they are easily overcome.

With the above directions, good crops of Gooseberries can be depended upon, on any soil not too dry and sandy. In sandy situations it is not safe to depend upon any but the American sorts.

List of Gooseberries for General Cultivation. — *Houghton's Seedling.* — An American seedling, generally exempt from mildew. Fruit small, dull red; very productive; plant low and spreading. See engraving on preceding page.

Red Warrington. — Growth erect, plant very thorny; fruit large, bright red, and of excellent flavor, maturing late. One of the most valuable English varieties.

Early Sulphur. — Branches erect; fruit roundish, medium size, and of the very best flavor. A valuable early variety.

Whitesmith. — Branches erect; fruit large, roundish oblong, rather hairy, and of good flavor; rarely ever mildews. A very productive and fine variety.

List of Gooseberries for Marketing. — *Houghton's Seedling* and *Whitesmith.*

CULTIVATION OF THE BLACKBERRY.

Long as this berry has been known, and much as it is esteemed for its excellence when gathered from the bushes growing spontaneously in many parts of the country, its successful cultivation in the garden is of recent date. At the present time we are fairly entitled to consider it an established resident. The New Rochelle Blackberry has become quite famous, and we doubt not many new sorts raised from it will ere long supply all we can desire in that direction.

The Blackberry ripens, as is well known, during the hottest weather of our hot summers, and unless some care is taken to provide against the plants suffering from a want of water, and the fruit from too great exposure to the intense heat of the sun, the greatest success will not be attained. It will be seen that the following directions have some reference to these facts.

The soil chosen should be rich, deep, and of such a character as not to bake in dry weather. A northern or western exposure is good, and a soil inclining to vegetable mould and light loam is favorable. The

plants should be set in the spring, and with considerable care, as the roots are not numerous, but large and difficult to take up in good condition. Plant in rows six feet apart, the plants three or four feet apart in the row. During the first season, there may be some small crops raised between the rows, as the plants will not spread rapidly; but the second spring the ground between the rows should be mulched with straw, and kept so constantly; only in the spring of each year, the old mulch, (and if the canes are not strong enough, some manure also,) should be dug in, and new mulching spread upon the surface. The third spring after planting, there should be a strong wire run along each row, about two and a half feet from the ground, fastened to stakes at intervals of eight or ten feet, to which the bearing canes are to be fastened by bending and training them along the wire. In this manner the fruit is protected from the sun, by the young canes which annually grow up and shade them.

New Rochelle or Lawton Blackberry.

The only pruning required, is the removal of all the dead wood of the past summer's bearing canes in autumn, and the shortening of the young wood to two-thirds its length in early spring. In very severe climates protection is necessary, as in the case of the Raspberry, and may be given in a similar manner.

Blackberries for General Cultivation. — *New Rochelle, or Lawton.* This fruit is said to have originated at New Rochelle, in the State of New York, and is the largest and best variety in cultivation. Ripening as it does when Raspberries are gone, together with its large size and productiveness, this fruit must become a tenant of every well regulated garden, and will be regarded as a valuable acquisition. We give a good engraving of it, which will show its large size and fine appearance.

Dorchester, or High Bush. — This is also a fine, productive and hardy variety, but not quite so large as the Lawton.

CULTIVATION OF THE CURRANT.

This small but exceedingly useful fruit has been long cultivated, and

can now be seen in every garden; but few persons can yet be found who have any just idea of the fruit in its perfection, as seen in specimens of the best varieties under high cultivation. Commonly, currants are planted in a row under the shade of a fence or building, and allowed to grow in a mass of old and young wood, with no pruning and no care; it being scarcely possible to get near the roots with the spade, so dense and hedge-like does the plantation become. Even under such treatment, the Currant is invaluable; how much more, then, may we expect from the same varieties, under a different course of treatment! The best improved sorts are entitled to take rank among our most valuable garden fruits.

The culture of Currants is exceedingly simple and easy, nothing more being required than a rich soil, with an exposure suited to your wishes in regard to early or late maturity of the fruit. It will flourish well in any situation, provided air and sunlight are given in abundance. It will also bear partial shade. In cool situations, it retains its fruit during all the month of August and part of September. The plants should have all the eyes or sprouts taken off from the bottom, and for the space of one to two feet up, the single stem only being left. In this way, room is secured beneath the bush to keep the ground clean and mellow, and to apply manure annually, which is necessary to its best success.

The top may be allowed to spread rapidly, and in three years from planting a fine head is secured. By a little care in annually cutting away the poor and feeble branches, and such liberal pruning as will keep up a vigorous growth of young wood, a healthy and exceedingly productive plant is secured; the produce of which, besides being greatly superior in quality, will far exceed in quantity all the *good* fruit which can be procured from the "hedge-row" system.

In every good plantation there should be more than one variety, as the sorts vary much in time of ripening, size and color of fruit, productiveness, beauty, &c.

The many useful purposes to which this fruit is adapted, and the certainty with which fine crops may be relied upon under such varying soils, situations and climates as our country presents, makes it emphatically one of the most valuable fruits for general dissemination; and we hope to see the improved varieties and modes of cultivation become rapidly introduced.

Currants for General Cultivation. — *Red Dutch* — Very productive; vigorous; good.

White Grape. — Very large; very productive; excellent.

Victoria. — Large; late; productive.

Black Naples. — Very large and very productive.

Budding can be done on the Pear, Apple and Cherry in June and July, and on the Peach to the middle of September.

TREATMENT OF GRAPES IN COLD HOUSES.

WRITTEN FOR THE RURAL ANNUAL, BY J. SALTER, ROCHESTER, N. Y.

MAKING THE HOUSE.

THE *shape* of the cold grapery is not of much consequence, provided there be, in proportion to the size of the house, a large surface of glass exposed to the sun, and also ample and easy means of *top* ventilation. It is of much importance, also, that the house be moderately well built, the glazing well done, and all the ventilators made to fit, so that the house can be shut up close when necessary; for there is nothing more detrimental to all tender, growing plants, than draughts of cold air, through holes in the glass, and badly fitting ventilators. It has much the same effect on plants that it has on a person who is sitting in a warm room, near the door, with his neck at the key-hole or a crack in the window — with this slight difference, that the person, when he feels he has got a pretty stiff neck, can move away, but the poor plant has to take it. The situation is not of much consequence, provided the house stands fully exposed to the sun, and where ample drainage can be given to the border.

Perhaps the cheapest kind of house, and one that will answer every purpose perfectly, can be built in this way: Mark out the site, 24 feet wide and 48 feet long, then dig out the soil to the depth of 18 inches, 6 feet within these limits and 10 feet without; this will give room for a border 16 feet wide and the whole length of the house; make the other side the same. Set strong cedar or oak posts, 6 feet apart, all around the two sides and one end, at least three feet in the ground and three feet six inches out. The north end, with a door in, can be boarded up if thought best. Cut the posts off so as to have them all three feet six inches in height above the bottom of the border. Lay a 4 by 6 inch sill on the posts, well secured at the joints and spiked down. It will take 17 rafters on each side, 16 feet long, of good 2 inch by 4 inch stuff. A ridge-pole 1½ by 6 inches. When the rafters are set up, this will form a house 48 feet long, 24 feet wide, and about 11 feet high from the sill to the apex, and the glass will lie at an angle of about 45 degrees, which is generally considered best. It will take three purlins, of 2 by 2 inch stuff, to be nailed on the rafters at four feet apart, on each side the house, and a plate along the bottom of the rafters. The sash-bars should be of 1 inch by 1½ inch stuff, with rebate of one-half inch, and 16 feet long. They can be nailed to the plates, the purlins, and the ridge-pole, at seven inches apart for 7 by 9 glass. The purlins can be sunk into the rafters a little, if necessary. The ventilators should be about 2 feet 6 inches wide by 4 feet long; they can be hung on hinges at the tops, and set open from below with a thin iron bar, three feet long, with holes in to fit on a pin inserted in the purlin,

which will serve to keep them down or set them up. There should be three ventilators on each side of a house 48 feet long, and one in each end, independent of the door. A little capping and casing on the top and on the ends will be wanted, and gutters to conduct the water to a cistern inside.

The internal arrangements consist of a large cistern sunk below the floor — a pump and small cistern, to be always kept full — a watering-pot and rose — a syringe or force-pump, and a trellis of wire to train the vines to. A very good way to make the trellis, is to have some tittle hooks made of one-fourth inch rod iron, 9 inches long, with an inch and a half thread on one end to screw into the rafter, and a hook on the other end just large enough to lay a rod of three-sixteenth inch rod iron into it. These are to be inserted into the rafter, at 18 inches apart, beginning at 18 inches from the bottom, and at right angles with the rafter; the three-sixteenth rods to lay on these hooks parallel with the purlins, and wires again, of one-sixteenth inch, to be run up across the rods, at 8 inches apart and parallel with the sash-bars. These wires can all be secured together, by tying with brass or annealed iron wire of small size.

This is the cheapest kind of house, yet if well built, and managed properly, it is capable of producing as fine a quality of grapes as the most expensive structures. Perhaps the curvilinear form would be considered the most ornamental, and certainly is the most convenient to work in — giving a great deal more head room. It also takes up less space; twenty feet being wide enough for a house of this height — twelve or thirteen feet to the ridge. These houses, of course, can be extended to any length, or contracted as may be required. If a lean-to house only be required, the half of either of the foregoing will answer perfectly; only that the lean-to should stand as nearly south as may be, while the span-roof should run north and south.

PREPARING THE BORDER

If on a wet, tenacious soil, it should be done by digging a drain two feet wide and one foot deep, all around the excavated space. If on a moderately light and porous soil, one foot wide and one foot deep, along the bottom only, will do — being careful that the bottom of the border has a gradual descent to the drain, and the drain has a descent to an outlet. Along the bottom of the drain lay a double row of two-inch drain tile, or, if readily procured, a single row of three-inch, and fill up the drain with stones or brick-bats. Then cover the whole excavated surface, drain and all, six inches deep with rough stone, or broken bricks, or anything that will make a clean, efficient drainage; then cover the whole with turf sods placed with the grass side down, and it is ready to receive the compost for the border. The best materials for the compost, are good, turfy, loamy sods, cut three or four inches thick, from an old cow or sheep pasture. The loam should be of a yellowish brown color, and feel soft and velvety to the touch. These are the *best*, but other good turfy sods will do. They should be

chopped up with the spade into lumps about the size of a man's fist. Add to the sods one-third in bulk of good black, rotten manure, from an old dung-bed; one-fourth well decomposed leaf-mould; about one-eighth broken bones, just smashed up with an old axe or hammer; as much charcoal as bones, and some old rough mortar or lime rubbish, if to be had. If the turfy sods cannot be had, mix the other materials with the soil that was thrown out from the border, and, if not *very* bad, it will do — only add a little more manure. This compost should be prepared and mixed three months beforehand, if possible, and turned twice. The compost can be filled in to the top of the posts, as it will settle down six inches, leaving then a border two feet six inches deep, — and leaving room for a six inch bottom ventilator, if thought best. But I have nailed my bottom ventilator up, and never use it; the canes ripen perfectly without, and that is all that is necessary. If no ventilator is used, this bottom six inch space must be nailed up with a board nine inches deep, to sink three inches into the border to prevent cold draughts.

SELECTING THE VINES.

In selecting vines, choose those with solid, well ripened wood, with round and prominent buds, and clean, healthy roots. One year old plants, propagated from a single eye, are usually considered best; though those of two years old are not objectionable, provided they are well ripened, clean, and healthy.

PLANTING THE VINES.

If the house and border have been prepared the fall previous, which they should have been, the best time for planting will be about the second week in March. Before planting, loosen up the border inside the house with a fork. Then prepare some mould, the same as that of which the border is composed, break it up fine, and add to it one-half leaf mould and one-third lake or river sand, if to be had; if not, the border compost will do; but young vines root much more readily in well decomposed leaf mould and clean lake sand. Where each vine is to stand, spread about one or two inches of this compost, then turn the vine out of the pot and shake all the earth off the roots, and if there be any bruised or decayed roots, cut them off with a sharp knife. Place the vine on this earth, about one foot inside the house, spread the roots out horizontally in all directions, then cover them over with the same material two inches, and pat it down firmly with the hand. When all are planted, give a moderately good watering. Before planting, cut down the vines to about six inches, leaving two or three of the best buds at the bottom. The object of leaving more than one bud, is to guard against accident, and to give a better choice of selecting the best shoots.

If the house be not ready in time for planting before the vines have begun to grow, it will be better to re-pot them into larger pots, and keep them growing in another house or on a hot-bed, until the middle of June, and then plant them without disturbing the roots. Otherwise, if planted after they have begun to grow, they are apt to receive such

a check from being planted in the cold earth, that they may hardly recover the first season: whereas if planted early, and obtaining a good start with the season, they may be grown well enough to bear a small crop the following year.

AFTER-TREATMENT OF THE VINES.

First Year. — After the vines are planted, clear up the house, and lay down some old boards to walk upon. Keep the house closed two or three weeks, just giving sufficient ventilation at the top to lower the temperature to 60 or 70 degrees. By the second or third week in April the buds will be bursting. Syringe them gently overhead, morning and evening, in warm days, and omit it in cold, dull or wet weather. By the first week in May, the buds will be grown far enough to see which will be the best to leave. Perhaps it will be better to let them grow until the best shoot is fairly secured to the wires, then rub all the others off. By this time the mercury may be allowed to rise to 75 or 80 degrees in the middle of the day. Syringe the vines morning and evening in warm weather, but avoid wetting the leaves much in bright sunshine. Keep a moist atmosphere, by dampening down the floor of the house with a watering-pot and rose. Do not leave the door open, or give any other *bottom* ventilation, but allow the over-heated atmosphere to pass off at the top.

By the first of June the vines ought to have grown from one to three feet. Keep the heat as steady and even as possible; ventilate early in the morning, as soon as the mercury begins to rise a little, never allowing the house to get hot and then admit a quantity of cold air; it leads to very baneful results in all plant culture. As the house warms up, ventilate a little more; allow the mercury to rise to 95 or 100 deg., but not above 100 deg. Lower the temperature in the afternoon gradually, as it was raised in the morning. Keep the atmosphere of the house moist, by dampening the floor with a watering-pot and rose, and syringe the vines overhead at shutting up time, an hour before the sun leaves the house, in all mild weather, but not in dull or cold windy weather. Keep the vines carefully tied to the wires, leaving the ties loose enough to allow for the swelling of the canes. As they advance in growth, there will be small laterals produced all the way up the cane; pinch them back to one leaf, all except one or two at the top, which leave in case of accident to the leader. They will want this sort of pinching back about once a fortnight, and at the second pinching cut those laterals clean out that were left the first time; being *very* careful not to injure the large leaf, or the bud at its axil, which will be wanted for fruiting next year. Pinch out all the tendrils as they are produced. Continue this sort of treatment until the second week in August; then begin to keep the atmosphere somewhat drier, and give a little more air. As the wood turns brown, by the middle of September, withhold water altogether, and in warm nights allow the top ventilators to remain open a little all night. When the vines have reached the top of the house, do not stop them, but train them down between

the vines on the opposite side of the house. By the middle of October all the lower part of the cane will be well ripened, and the top part may be cut back to the ridge of the house, where they have grown beyond it; this cutting back will strengthen the buds on the lower part of the cane, yet not endanger their bursting. Now leave the house open night and day, except in wet, stormy, or frosty weather.

Should there be dull, wet weather in July, keep the house a little closer and drier, and strew over the floor a little sulphur, which will prevent mildew. And if a vey dry summer, the border will want one or two good soakings of water, at intervals of two or three weeks. For this purpose, the water, before using, should be allowed to stand one whole day in a hogshead exposed to the sun. If two or three pounds of guano can be put into the water, so much the better. As soon as the leaves have fallen, it will be time to prune the vines. Cut the strongest back to seven, and the weakest to five feet in length; make the cut two inches above the bud. Commence at the top to disbud them; leave three buds, one for next year's leader, and the other two for fruit-bearing spurs; *cut out* the next two buds, one on each side the cane; *leave* the next two, one on each side, and cut out the next two, one on each side; and so on down to within eighteen inches or two feet of the bottom, below which all had better be cut off.

After they are pruned, give a coating two inches thick of rotton manure, all over the border, inside and out, and fork it in, being careful not to injure the roots. When this is done, fix some boards all along the rows of vines, forming a sort of box, two feet wide and two feet deep. Bend the vines down along this box, tying the top of one to the bottom of the other; leaving the lower part of each vine standing upright for a foot or so, so as not to injure the collar. When they are all tied down, cover them well with clean dry straw, leaves, or old mats. Then take some blocks of wood and bore a hole into each, with an inch augur, three inches deep, partly fill them with arsenic and Indian meal, and lay about where mice are expected to resort, should there be any. Then the whole outside border may be covered over with long, littery manure, eight inches thick, to keep out the frost, which may be left on next summer for a mulching. There is nothing more to do but keep the house open in mild and bright weather, and closed in wet and severe weather.

Second Year. — As the winter passes away and the spring comes on, and vegetation begins to feel the influence of mild weather, it will be time to examine the vines. When it is perceived that the buds are beginning to swell, they must be carefully taken out of their winter quarters, the covering taken away, and the house cleaned up, and all the spiders and cobwebs carefully washed out. The vines must now receive a good painting over with sulphur and soft-soap. Take a pound of sulphur and as much soft-soap as will make a pretty thick paste; then with a common clean painter's brush paint the vines all over, except the buds, with the mixture. This will effectually kill all insects or eggs of insects, should there be any, and tend very much to

prevent mildew. When this is done, the inside border should receive a thorough soaking of water. Allow the vines to remain with their upper ends on the floor, and in mild weather syringe them all over two or three times a day. Lower the temperature of the house, by giving top ventilation; keep the temperature as near 70° as possible.

As the spring advances, and all danger of late frosts is past, and the buds have burst into growth, the vines may be tied to the wires in their proper places. As they begin to grow vigorously, allow a little more heat in the middle of the day. Always remember to keep as even a temperature as possible; ventilate a little, early in the morning, as the mercury begins to rise, and a little more as the day advances. By the second week in May, allow the mercury to rise to 90° or 95° in the middle of sunny days; still remembering to apply the syringe freely in warm weather, omitting it entirely in cold and dull weather. As the vines advance in growth, keep the young shoots carefully tied to the wires; but this must be done very carefully and gradually, for they are so tender and brittle at this stage of growth as to break off with their own weight, if not attended to. By the 20th of May they will be coming into bloom; then suspend the syringing altogether, and allow a little more heat — 95° to 100° in bright days, and keep the atmosphere much drier while in bloom. While they are in bloom, go over them every morning and gently tap the footstalk of each bunch with a light stick, which scatters the pollen and assists their fertilization; for some of the bad setters, such as Cannon Hall Muscat and Muscat of Alexandria, take a dinner plate, warmed in the sun, and hold it under bunches of Black Hamburg or other good setters, then give the footstalk of the bunch a sharp tap with the finger and thumb, which will scatter the pollen into the plate; then with a thick camel's hair brush, collect the pollen from off the plate and brush it gently on the pistils of these bad setters. In this way I have had both of these varieties set so well as to be obliged to thin out two-thirds of the berries: whereas, if managed only in the ordinary way, not one berry in fifty would have been fertilized, and would consequently have fallen off. Cannon Hall Muscat, when well grown and in good order, is the very best grape in cultivation, but perhaps the most difficult to grow.

Keep the fruit-bearing branches carefully tied to the wires, and pinch out the top, three leaves above the bunch. By the 15th of June the berries will be as large as peas, and will require thinning. When it is seen which will be the best bunch on each branch, take small strips of basswood bark and loop up its shoulders, in a horizontal position, to the wires, and cut the other bunches away, leaving but one bunch upon a branch. It will not be advisable to allow them to bear many the first year; better be guided by comparative weight than by number of bunches. Some of the Hamburghs will weigh one and a half to two pounds, while some of the white varieties — such as *Sweet-Water* and *Chasselas* — may not weigh over one-half pound. Allow the stronger vines to bear about six or seven pounds, and the weaker ones about four or five pounds; and this mostly at the upper part of

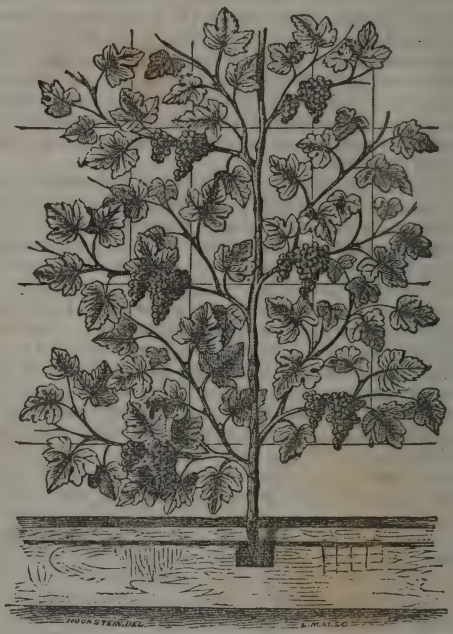
the vines, allowing the lower part to rest the first year. Those vines that are very weak should not be allowed to bear more than one bunch. When all are looped up, proceed to thinning out with a thin, sharp-pointed pair of scissors. A well-set bunch of Hamburgh will want from one-third to one-half of the berries thinned out, and in some instances even more; and some of the closer setting varieties even more than this: the object being to thin out enough to allow the berries to swell to their full size; so as not to appear crowded when fully grown, nor yet loose and straggling.

Should the weather be cold or dull about the first week in July, strew over the floor three or four pounds of sulphur, and keep the atmosphere of the house somewhat drier and warmer for six or eight days. Repeat this in two or three weeks. After this, keep the atmosphere of the house moist, by dampening down the floor, and keep the temperature as near 95° or 100° as can be. Continue this treatment until the first week in August, when some of the white grapes will be getting ripe. Then give more air, and keep the house drier. During all this time, the small laterals, on the fruit-bearing branches and up the main cane, should have been pinched out to one leaf as they were produced. By the 20th of September the grapes will be all ripe, and the wood turned brown. Take a sharp knife and cut out most of the small laterals, on the fruit-bearing branch and up the main cane, close to the bud in the axil of the leaf, being careful not to cut the bud or the leaf.

The house may now be left open night and day in mild weather, and closed in bad. As soon as the leaves have fallen, prune as last year, only leave spurs upon the lower part of the vine, three buds in length, and commence at the bottom of the new wood to disbud, instead of at top as last year. Select two good buds at the lower part of the new wood, and in the right position and proper distance to form a continuation of spurs; when these buds are selected, cut out the next two, one on each side, and leave the next two, one on each side, and so on the whole length of nine to twelve feet, according to strength of cane.

Third Year. — The fruit-bearing branch is taken from the highest good bud of the spur, and trained up at an oblique angle, and a branch from the lowest good bud is trained out horizontally, and not to bear fruit. When the fruit-bearing branch has grown so as to show which will be the best bud, it is to be stopped three or four leaves above the bunch. If a very strong shoot, stop it three leaves above; and if not very strong, stop it four leaves above. The branch that is trained horizontally and not to bear, is to be stopped when seven or eight leaves in length. The other treatment same as last year.

The annexed cut is a section of a vine trained according to the double spur system, which is preferable to any other, where vines are planted three feet apart. They not only take up less room on the wires, but will bear a greater crop without injury to the vine. Vines fourteen feet long will average sixteen bunches, while those trained according to the long-rod or renewal system will only average twelve bunches, without injury from over-cropping.



Section of a Vine Trained According to the Double Spur System.

At pruning time, (middle of November,) the fruit-bearing branch of the present season is cut close out, and the non-bearing branch is cut back to the second or third good bud. Next year the bearing branch is taken from the highest good bud of the spur, and the lowest good bud is trained out horizontally in the position of the bearing branch of the present year. When the vines are pruned, the rough, loose bark can be rubbed or scraped off, being careful not to injure the live bark. Then pack away the vines, as last year. The outside border should be lightly forked up, and receive a good covering of long, littery manure, nine inches or a foot thick.

BEST VARIETIES.

Perhaps the best selection of varieties of Grapes for a cold vinery of this size will be the following:

Black Varieties. — Black Hamburgh, 10; Victoria Hamburgh, 2;

Wilmot's Black Hamburgh, 2; Zinfindal, 1; Black St. Peters, 1; Black Frontignan, 1; Prince Albert, 1; West's St. Peters, 1.

White Varieties. — Chasselas de Fontainebleau, 2; White Malvasia, 2; Chasselas Musque, 6; Dutch Sweetwater, 2.

Red Varieties. — Rose Chasselas, 2; Grizzly Frontignan, 1.

These will ripen in succession, from the last week in July until the middle of September, and remain good until the frost can no longer be kept out. The *Dutch Sweetwater*, *White Malvasia*, and *Chasselas Musque*, will be the first to ripen.

I do not think it advisable to plant either *Cannon Hall Muscat* or *Muscat of Alexandria*, (or not more than one of each), except where a little artificial heat can be commanded, either by a common stove or other means, just while they are in bloom. But if artificial heat can be had, plant them by all means. They require a temperature of at least 65° to 70° by night, and 85° to 95° by day, with sun, while in bloom.

PLANTING AN APPLE ORCHARD.

An experienced correspondent of the *American Agriculturist* recommends those intending to plant an apple orchard for their own marketing, to confine themselves to a few varieties, and to select such as are hardy, strong growers, and as near as may be annual bearers, — with sizeable, fair, well shaped fruit, of *fashionable* colors: and these are yellow and red, or yellow striped with bright red. He mentions the following varieties for particular localities:

SUMMER APPLES.

If you are near a large market, not easily overstocked, early varieties are usually most in demand, and at the highest prices. Yet early varieties are not usually as good bearers as the later kinds, but they sell quick, at good prices, and are readily off your hands. Of these kinds, popular and profitable, may be named—Early Harvest, (tart;) Bough, (sweet;) American Summer Pearmain, (sub-acid;) Keswick Codlin, in season for cooking from July to October — the *best* tart of any other, and the soonest cooked; Red Astrachan, (sub-acid;) and [in New England] William's Favorite, (sub-acid.) These kinds are enough. There are some other varieties *local* to certain places, that are decidedly good, and when you find them, plant largely of such.

FALL APPLES.

Fall varieties, in order of ripening: Golden Sweeting; Fall Pippin, (sub-acid;) Jersey Sweeting, (for New Jersey and Central New York;) Gravenstein, (sub-acid;) Lyman's Pumpkin *Sweet*, (for baking;) Porter, (sub-acid, and one of the best for cooking;) Rambo, in New Jersey and Ohio; sub-acid.)

WINTER APPLES.

Winter varieties: Baldwin, (sub-acid).—Yellow Bellefleur, (sub-acid), for the rich soils of the Western States; for cooking, and wonderfully fine.—Hubbardston's Nonsuch, (sub-acid), for New England and New York.—Jonathan, or Philip's Rick, (sub-acid), for Ulster county, and the Hudson River counties between Albany and West Point.—Newtown Pippin, (sub-acid), wherever it will flourish and bear well, and that is chiefly on Long Island, New Jersey near New York, and the Hudson River counties; this is the very best apple for the table and kitchen in the world!—Northern Spy, (sub-acid), for Western New York.—Pomme Grise, (sub-acid), for Canada and the northern counties of New York; this is a very long keeper, and of the richest flavor, though small.—Rhode Island Greening, (sub-acid), for New England, New York, and Northern Ohio; one of the very best for cooking, but rather tart for the table.—For the same sections, English or Poughkeepsie Russet, (sub-acid); one of the richest of the long keepers; Roxbury Russet, (sub-acid); rich, and a long keeper.—Swaar, (sub-acid), for Ulster county, New York, and western counties of that State, on warm, rich lands.—Talman's Sweeting; the best winter-baking applr that grows, wherever it will flourish.—Esopus Spitzenburgh, (sub-acid), for Western New York and the Hudson River counties; this is the highest flavored apple known, excepting, perhaps, the Newtown Pippin.—Vandervere, (sub-acid), for warm soils of New Jersey and New York; no apple excels this in delicacy and richnese of flavor.—Waxen, Gate or Belmont, (sub-acid), for Northern Ohio.—Westfield Seek-no-further, (sub-acid); the *best* apple of the Connecticut Valley, and good in Western Massachusetts and New York.—Pomme de Neige, and Fameuse or Snow Apple, (sub-acid), for Canada and Western New York.

To these may be added, for the Southern country, as *tried*, substantial fruits in their seasons: Rawl's Janet, (sub-acid), for Southern Ohio, Indiana, Illinois, &c., and Kentucky for winter.—Cooper, (sub-acid); Fall; very fine in Ohio.—Limber-twig, (sub-acid), for winter, in Southern Ohio, Kentucky, and further North.—Primate, (sub-acid), early Fall, for Central and Western New York; and some other fine varieties local to the Western States, not now recollected.

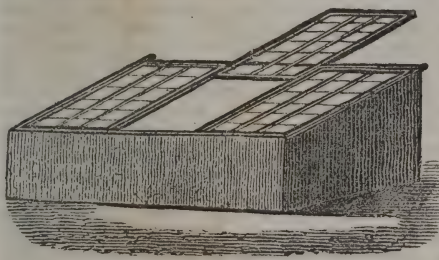
Shortening-In Corn.—A correspondent of the *American Agriculturist* says: "In going over a patch of sweet corn recently, I could find but few ears sufficiently forward for cooking. What struck me as singular was, that the ears which were mature enough for use, were those from which the silk and husks had been nipped off by cattle that had broken into the field a short time previous. In their haste and greediness they had left some ears thus shortened-in, and on these ears the kernels were large and full set, while all others throughout the field, and even on the same hills, were not as ripe or perfect until a fortnight after."

THE KITCHEN GARDEN.

WRITTEN FOR THE RURAL ANNUAL, BY J. SALTER, ROCHESTER, N. Y.

[THE extent to which the Kitchen Garden is neglected in this country is truly astonishing. Many of our most successful farmers have, strictly speaking, no garden at all. We know farmers of more than common intelligence, who have never seen a stick of celery or tasted a head of cauliflower, or even heard of that most delicious of all esculents, asparagus. "Farmers cannot afford to trifle away their time in a garden," says their apologist. Why not? we would ask. They can afford to build ten, fifteen, or even twenty thousand dollar houses,—to keep three or four carriages, and one or two fast horses. They can afford to furnish their houses luxuriantly, but cannot afford to supply their tables with a good variety of healthy vegetables! We are compelled to believe that the general neglect of the Kitchen Garden arises from a lack of correct knowledge, rather than from want of time or money. We are glad to perceive, however, that there is every year an increasing demand for treatises on the management of the vegetable garden, and we have great pleasure in presenting the readers of the *Rural Annual* an article on this subject, from one of our most experienced and intelligent gardeners.—PUB.]

MAKING A HOT-BED. — About the last week in February, or as soon as the severest weather is gone, manure should be prepared for hot-beds, where hot-bed frames and sashes can be had — and no garden should be without them. The manure, if fresh from the stable, should be well shaken out, mixed, thrown into a heap, and left for ten days or a fortnight, under a shed or other sheltered place, where cold wind and driving snow or rain can be kept off, when it can be brought out to some sheltered situation, and shaken and squared up into a bed three feet high and one foot larger every way than the frame that is to stand upon it. The manure should be well beaten down with the back of the fork while the bed is being made, and, if very dry, watered. When done, place the frame upon the bed, shut the sashes close, and cover with old mats or dry litter for a few days. Examine the bed the second or third day, and if very hot let in a little air at the back of the frame for one day and



Hot-Bed Frame.

night, by raising the sash half an inch; if not very hot, the earth can be put on the bed at once.

The earth should be prepared in the fall, and kept under cover all winter, if possible; well rotted, turfy sods, with one-third well decomposed stable manure, is the best. If this is not to be had, take some of the best garden soil that can be procured, well enriched with good rotten manure, and a portion of leaf mould, if to be had. When this is prepared, put it on the bed to the depth of about six inches, rake it smooth, and pat it down moderately with the back of the rake.

What to Sow in the Hot-Bed. — If a three light frame, of about six feet in width and twelve feet long, one light can be appropriated to the seed of early vegetables. Two feet square each, of the following, will be sufficient for a moderate sized family. For the first sowing, *Early Paris* cauliflowers; *Early York* or *Early Winningstadt* cabbage; the latter is the best early cabbage we have ever tasted. Purple egg plant; tomatoes; red or white solid celery; and a few peppers, if wanted. One whole light can be sown with Early Cabbage lettuce, and one with Scarlet Short-Top or Early Oval radish. The radish seed should be covered about half an inch, the others not more than a quarter of an inch. When sown, pat the soil down gently with the back of the spade, and give a very gentle watering. The lights should then be laid on and covered with mats or littery manure until the seeds begin to vegetate, when they must be uncovered in the day time and covered at night. Should there be much steam rising, a little air must be given all night. Shortly afterwards, it will be time to sow a few cucumber seeds in the centre of each sash. If three seeds grow in each, it will be enough. When the cucumbers have made their third rough leaf, the top should be pinched out to make them branch, and the other things in the frame immediately around them should be pulled up and used first. The temperature should be from 60° to 65° by night, and from 75° to 80° by day. Give air in all mild days, and cover up at night. Should the heat decline too much, a lining of fresh manure, eighteen inches thick, should be applied all around the frame, within six inches of the top, and then covered with boards. Water when the earth looks dry, with water a few degrees warmer than the atmosphere of the bed — say about 80°. Any rank steam, from the manure in the frame, must be carefully guarded against; for if it come in contact with any of the young plants, they will be destroyed in one night; but it is easily smelt, and can be guarded against by leaving a little air all night, and hanging a thin mat over the opening to prevent cold wind.

Transplanting from the Hot-Bed to the Open Ground. — As soon as the earth out of doors gets warmed a little, and all danger of spring frosts is over, the tomatoes, cabbages, cauliflowers, &c., can be planted in their final places. Choose some warm, sheltered spots for the first crops, and plant in moist weather, or water a little when planted. The celery will be better if pricked out about four inches apart each way, in some light, rich earth, in a warm border, and left there for a month, before planting in the trenches. The lettuces and

radishes can be pulled and used as they are fully grown. When these are all cleared off, two or three inches of fresh earth should be put into the frame for the benefit of the cucumbers, and their branches spread out and pegged down where they are wanted to grow, and they will soon strike root, and the vines will thereby be much benefitted.

Fertilizing Early Cucumbers. — As there are not many bees at this season of the year, and not very much air can be given, it will be necessary to fertilize the cucumbers by hand. The male and female blossoms are produced on the same plant at the same time, and the females are easily distinguished by their having the form of a cucumber at their base. If they be fertilized, they will swell and be fit for use in two weeks; if not, they will turn yellow and drop off. Every morning, in bright weather, about nine or ten o'clock, when fresh flowers are seen, the staminate or male flower should be picked off, the petals torn from it, and then thrust into the centre of the pistillate or female flower. This may seem rather troublesome, but it is absolutely necessary for the first fruits. After a while the glasses can be left off altogether, in fine days; then nature will need no other assistance than that furnished by the bees and the wind.

Early Seeding in the Open Ground. — As soon as the ground is in good working order, select a part that is well sheltered and warm, and apply to it a good coat of well rotted manure, and dig and work it up well; rake it fine, and sow some radish and lettuce as recommended in the hot-bed, and some *Early Shorthorn* carrots in drills about nine inches apart, and cover with soil about a quarter of an inch. After all is sown, if the ground be light, it should be gently trodden down, and covered in cold nights with light, littery manure, until the seeds are all fairly up and are likely to be injured by the litter being pulled off and on; after which it can be cleared away. Also, at the same time, sow some *Flat Dutch* or *Drumhead* cabbage, and *Large Lenormand* cauliflower, for autumn and winter use. A quarter of an ounce of each, if good seed and protected from insects, will be an abundance for an ordinary family. Also plant a small patch of *Early June* potatoes, in some dry, sheltered place, and cover every night with litter, until they are up, or the nights get warm. When up five or six inches, earth up a little around each plant, and keep the earth well stirred and clean with the hoe; and this must not be neglected with the other crops.

If the seed beds of cabbage, and cauliflower, and radish, can be protected from insects in very hot days, with a milinette or gauze covering, it will be best; if not, dust them all over, when wet with dew, with wood ashes, soot, or air-slaked lime. These little pests (the fly, as it is called) make their appearance the first warm days in May, and if any of the cabbage or radish tribe be exposed to their attacks, they come in such myriads as to devour almost every thing before one is aware of it.

Early Peas. — Select a good piece of ground, and make it rich and mellow with plenty of manure and by deep digging. This should be done as soon as the frost is out, and the ground is in working condition. When the ground is ready, stretch a line across and draw with

a hoe a drill two inches deep; and if the drill be fifty feet long, it will take about one pint of peas. For a family of eight or ten persons, sow three rows each of the following varieties: *Prince Albert*, *Champion of England*, and *Knight's Dwarf Marrowfat*. If sown at the same time, these will come in succession from the middle of June to the last of July. Sow the first five rows five feet apart; this will leave room for four good celery trenches between the rows. The other rows can be three feet apart, between which can be planted lettuce or late cabbage. When the peas are up three inches, draw earth up to them on each side with a hoe; when they have grown three inches more, earth up again, and stick them, by placing fan-shaped bushes thinly along each side of the rows. When the peas have come into flower and the pods begin to swell, pinch out the top of the vine — the peas will be the better for it.

Asparagus beds should be lightly forked up, and raked smooth — being careful not to prick the crowns with the fork.

Forcing Pie-Plant.—If some old barrels can be set over the rhubarb plants, and banked round with manure, they will be forwarded a week or so, and the stalks will be very tender.

Beans. — In the first week of May sow some *Early Six-Week* beans; they will be ready for cooking by the middle of June. Sow again, at intervals of two or three weeks, up to the middle of August, if wanted so long. This will give a regular succession. When up three inches, draw earth up to them, on each side; when they begin to show their first flowers, earth up again.

The first week in May is also the right time to sow for the general crops. Let the ground be well manured and deeply spaded, and the lumps all broken up fine with the spade as the ground is being dug.

Onions. —Sow *Red Portugal* onions, in drills a foot apart. When up six inches, thin them to four inches apart in the row. Those that are pulled out, if planted in rather poor ground, in rows just wide enough apart to admit the hoe, will come in well for pickling. Plant in moist weather, or give a good soaking of water when planted.

Sugar or *Hollow Crown* parsnip, *Early Shorthorn* carrot, *Early Bassano* beet for early use, and the *Long Blood* beet for winter use, salsify or vegetable oyster, and round-seeded spinach, can be sown thinly in drills—the former eighteen inches apart, the two last twelve inches, and the seed buried half an inch deep. When all are sown, and the seed covered, if the soil is light, they should be trodden in gently, by walking upon the rows, setting the foot flat down on the drill. When this is done, let the ground be neatly raked, and if laid out in beds, let the edges be evenly cut, with the spade, to preserve a neat appearance. When two or three inches high, the parsnip and salsify should be thinned to five inches, and the Long Blood beet to nine inches apart from plant to plant. The Early Shorthorn carrot, Bassano beet, and spinach, can be thinned as they are wanted for use. Keep all clear of weeds, and the earth frequently stirred with the hoe.

Sweet Corn. — Sow sweet corn on hills in good ground. Draw the earth up into little hills a foot square at top and three inches high;

these hills should be three feet apart each way. Plant five or six seeds on each hill, one inch deep. When about a foot high, draw earth up to their stems, and leave but three plants in a hill. Sow in this way about twenty or thirty hills, according to the quantity wanted, at intervals of two weeks, up to first of August.

Lima Beans. — A good way to grow Lima beans, is to dig holes two feet square and one foot deep, so that from centre to centre will be about three feet. Mix two or three shovels-full of good manure with the soil which came out of each hole, and fill it in again. This will raise each into hills four or five inches high; drive a pole ten or twelve feet long into the centre of each hill, and plant six or eight beans around it, one inch deep. If three grow, it will be enough; if they miss, plant again.

Ridge Cucumbers, for pickling, can be managed as recommended for Lima beans, — only they should be protected from insects, by placing a little box, about eighteen inches square and six deep, over them, and covered with milinette or gauze, and the poles are not wanted. If more than three seeds grow, pull the others out; and when they have grown so as to fill them, the boxes can be taken away. The hills should be five feet apart each way.

Summer crook-neck squash can be managed in the same way as cucumbers; only the boxes will be required a little deeper. Boston Marrow winter squash the same, only planted six feet apart each way.

Melons. — Choose a dry and sunny situation. Dig holes two feet square, one foot deep, and four feet apart from centre to centre; fill them with a compost of good turfy sods and rotten manure, in the proportion of two parts of the former to one of the latter. Fill the holes to four inches above the level ground, and place a small box on the hill, and cover with glass, either with a sash made to fit or with large sheets of glass. When ready, plant eight or ten seeds of *Early Christina* muskmelon in the centre of each hill, and half an inch deep. When up so as to see which will be the best plants, pull all out but three, leaving the best. Should they miss, sow again. Water, with lukewarm water, when they look dry. Give air on warm sunny days, and shut up close at night just before the sun goes off the box. Search frequently for bugs, and catch and kill all that you can find.

These same remarks hold good for watermelon, only make the hills six feet apart, and add a little more manure to the compost. The *Orange* watermelon is the best.

Celery. — About the last week of May, or first of June, prepare the celery trenches between the first rows of peas. Dig a trench two feet wide and one foot deep, then fill to the depth of six inches with good rotten manure and dig it in, mixing it well with the bottom soil. When all is dug, rake it smooth, and stretch a line along the centre of the trench. Then take up the celery plants, with a ball of earth to their roots; strip off all the bottom leaves, and suckers if there be any, then plant them along the middle of the trench, a foot apart from plant to plant, press them in firmly with the fingers, without breaking the ball

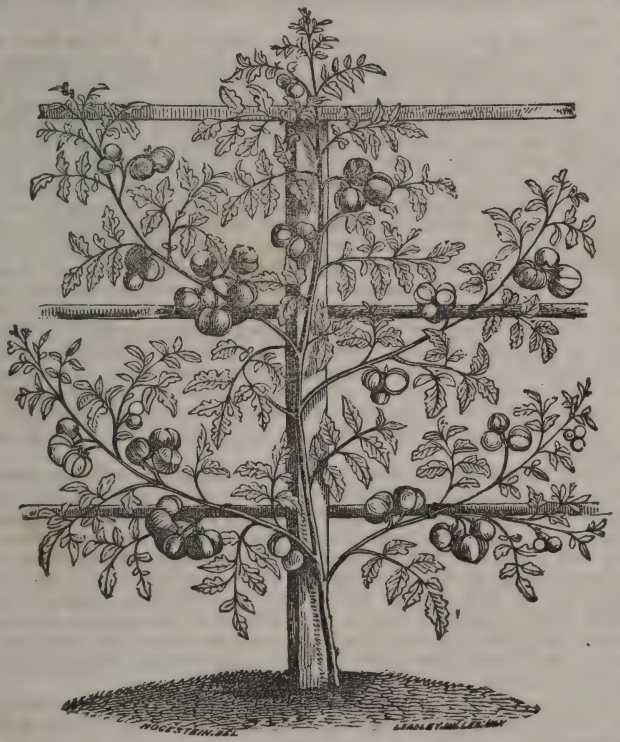
of earth about their roots, and give a good soaking of water. If the weather is dry, they will require watering once or twice a day until they become established. Examine them every two weeks, and pick off all suckers as they appear. About the middle of August, a few can be earthed up for early use in September. About the middle of September will be about the right time to begin to earth up the main crop. First examine and pick off all suckers, and bottom, broken, and cracked leaves. Then take the whole plant firmly in one hand, and keep the heart in the centre, and with the other hand tie a piece of string or bass matting around the plant, keeping the leaves close and straight, and so on with all the rest. When this is done, take a spade and earth them up about four inches, being careful that no earth gets washed into their hearts, or it will rot and spoil them. This operation should be repeated about every three weeks until finished.

Cultivation of Tomatoes. — The best situation for a few early Tomatoes will be on the south side of a board fence, or the south side or end of a house or barn, or trained to espaliars in any sunny or sheltered place.— Indeed, trained in this way, they are very ornamental, and can be used to hide any unsightly object, such as an old wall or board fence.

Tomato Vine — Fig. 1.

If a few of the best plants, when taken from the hot-bed, can be potted into three quart pots, and kept growing in the green-house or another hot-bed until they are eighteen inches or two feet high, and the warm weather has fairly set in, and then planted out in a good rich border, it will help them a good deal. My mode is to treat them in this way:—The seed is sown in the green-house in February, and the plants are kept growing in pots until they are from one to two feet high. When the warm weather has fairly set in, they are planted in a good rich and deep soil, but well drained. At planting, about two table-spoonsful of Peruvian guano is mixed in the soil immedi-

ately about their roots. This gives them an early start, and assists them very much. When first planted, they will have somewhat the appearance of Fig. 1. As they advance in growth, the plant is trained upright until it has set the first bunch of fruit, when its top is pinched out; then allowed to grow on again until another bunch of fruit is set,



Tomato Vine—Fig. 2.

and then pinched out again. By this time it will have thrown out laterals from the bottom. One on each side the main stem is trained out and tied to the espaliars, and allowed to grow until it has set a bunch of fruit, and then its top is pinched out the same as recommended for the main stem. Branches are trained out, at intervals of nine inches or a foot apart, all up the main stem, and when fully grown

will have the appearance of Fig. 2. All superabundant shoots must be cut clean out as they are produced, likewise the little shoots as soon as seen in the axil of the leaves on the main branch.

Save seed from the roundest and best formed fruit, and you will soon get a better sample than those wrinkled things we usually see in the markets.

PRESERVING ROOTS FOR WINTER USE.—About the first to the tenth of November, carrots should be all carefully taken up, without cutting or breaking their roots, (in dry weather if possible;) when up, their tops can be cut or twisted off about half an inch from the crown. Then fix up some boards in one corner of a very airy cellar, forming a sort of box that will keep the pile of roots from sliding down and the sand from running away. Now lay a layer of roots about three or four carrots thick, and as even as they can be laid; then cover the whole with moderately dry sand, or fine earth, (sand is best, if it can be had,) putting just enough to fill in the spaces between the roots; then another layer of roots and sand, and so on to the top. If you have a great quantity of roots, and no cellar room, they can be kept out doors in a pit. Choose the highest and dryest spot of ground you have, and dig a pit about four feet wide and eighteen inches deep. Put in the roots dry and clean, without bruising, laying them in the form of a ridge or open roofed house. They should not be more than three feet in depth from the bottom to the apex, or they will be apt to heat and rot. When the roots are in, cover them with clean dry straw, three inches thick, and cover the straw with earth a foot thick. The pit can be dug to any length. Beets, Parsneps and Potatoes will keep in the same way.

A part of the crop of Celery should be taken up and have their loose roots trimmed, the cracked and broken leaves taken off, the tops shortened a little, and each stick tied round with a piece of bass matting, to keep the leaves from being broken and the dirt from getting into their crowns. They can then be placed upright, in a deep box or dry-goods case, as close as they will stand, and the spaces between them filled in with sand or dry earth. They will keep good, if not frozen, for two months or more. That left out in the trenches must be banked up to the very top; the bank must be at least two feet thick, then covered with clean straw, and the straw covered with boards to keep the wet off.

Salsify may be kept as recommended for Carrots; but this plant is very hardy, and a part of the crop can be left in the ground the same as Parsneps.

Cabbages can be kept very well, by pulling them up with a little earth about their roots, and all the large loose leaves stripped off, and then placed upright in a cellar and some more earth thrown over their roots.

Any late Cauliflowers that may not have headed before the cold weather sets in, will head up if placed in the cellar and managed as recommended for Cabbage. So also with Brocoli.

ORNAMENTAL GARDENING.

WRITTEN FOR THE RURAL ANNUAL, BY R. R. SCOTT, ROCHESTER, N. Y.

IT is a wise arrangement in the physical and moral constitution of society, that man cannot enjoy happiness, or fulfil his destiny, by exclusive attention to physical wants, or the gratification of his sensual instincts or appetites. Were nature so arranged, we should pursue life without feeling any of those strong impulses or desires which spring up and are awakened by the observation of the objects which surround us — the mountains, forests and rivers, the hills and trees, and brooks, and plants, and flowers, which, in the most uncultivated aspects of nature, impart feelings of gratification and enjoyment to the mind happily susceptible of such impressions. Such impressions and such minds are evidences of the "Divinity that stirs within us," and leads us to recognise in these creations, portions of that wonderful system so unapproachable in its resources, and replete with means and appliances to satisfy all the demands and requirements of our physical and intellectual desires. Wild, uncultivated nature, is full of objects of gratification to the bold, adventurous spirit who seeks rather the tangled jungle and almost impassible forest, — deserting, in order to gratify his peculiar disposition, the more systematic landscape, with its artificial arrangement, formed in compliance with recognised rules, said to be in accordance with the more prominent general principles by which natural scenery is grouped.

To this end, and in accordance with the changes and modifications which modern civilization has forced upon us, we are called upon to present to the lovers of rural beauty, in its more cultivated forms, our ideas of the improvements and additions which another year has brought to notice. Should it be deemed by some an unnecessary and superfluous work, to direct attention to objects which are so obvious to the senses as trees, and shrubs, and flowers — so numerous that we cannot stir a foot where vegetable forms are not attendant to minister to our pleasures or wants, and yet so little valued or cherished by the mass of our fellow mortals, that not one in a thousand can give us the recognized names or the general characteristics or uses of the commonest plants, shrubs, or trees. Again, it may be urged, as it has been, that an accurate knowledge is not necessary to the enjoyment of those natural forms; that the minute study of their physical constitution and place in a systematic arrangement, add nothing in the way of use

or gratification, sufficient to compensate for the labor and study required to arrive at this knowledge.

With such suggestions and conclusions we are entirely at issue, as we feel convinced that the increasing taste for scientific knowledge, and especially that knowledge which will familiarize every thinking man with the vegetable forms which surround him and minister to his daily wants, will demand more attention to this interesting branch of natural philosophy. Every man of taste, who goes abroad into the country, is struck with the diversity of form — the varied aspect of the landscape — the beauty of the minute organizations which necessarily at times arrest his attention; the individual history of these — their functions and offices in the grand system of nature — forms surely a subject worthy of his more calm consideration.

With a view to direct the attention of those who desire to learn a little more of these mute but animated witnesses of Divine consideration, is the purpose of this our second contribution to the RURAL ANNUAL, which we hope will be received as an humble endeavor to add to the enjoyment of the rambler over the quiet path which leads from the busy city to the fresh and ever-varying country,— as well as to aid in the proper selection of such trees and plants as shall add to the beauty of the pleasure ground and flower garden, that pure and hopeful source of harmless gratification.

We are not required to request the consideration of the reader to the utilitarian branches of horticulture. The spread of sound information over the entire extent of our country, upon the subject of fruit and vegetable culture, is sufficient evidence for us, that the useful is not at all neglected. Our pomological conventions, fruit-growers' societies, and even the endowment of professorships in newly organized colleges, have relieved us from any fear that gardening in its merely useful branches can be at all neglected in this country. Horticultural societies have not overlooked the importance of the ornamental branches; they however demand our persevering attention, as the cultivation of plants and flowers aids only in the advancement of the moral nature, obviously, though indirectly, it does for the physical much more than it claims credit for. In the following pages we calculate only to offer a few brief suggestions and hints, and hope this contribution to the ANNUAL for 1857, will not be regarded as a treatise full and complete on a subject so vast and varied.

THE GARDEN AND PLEASURE GROUNDS.

ARRANGEMENT AND PLANTING.

The laudable desire which exists in the minds of a large portion of our citizens, for a Rural Home, is one of the most gratifying evidences of increasing refinement of taste, and the just appreciation of the enjoyment which may be derived from the cultivation of the soil and the production of flowers and fruits. Commercial prosperity may be promoted and secured, at the same time that social comfort and domestic enjoyment are neglected; but such prosperity at such a price is by no

means worth the sacrifice. Before, however, the means can be secured for the purchase and decoration of a home in the country, attention must be given to those commercial pursuits which remove our people from contact with rural life, and prevent their becoming conversant with those operations, a slight knowledge of which is indispensable even to the amateur farmer and gardener. To compensate for this want of practical knowledge and experience of rural affairs, the merchant who desires a pleasant home in the country has recourse to written descriptions and recorded rules, and endeavors by a little study to gather such hints and suggestions as will enable him to gratify his own ideas in the arrangement and planting of his grounds and garden.

In countries where the science of Horticulture has reached its highest point of excellence, encouraged by immense accumulated wealth, and the aid of professional skill of the most varied character, the principles of this science, and the practical operations thence derived, are little understood and never practiced by those who contribute the means for its promotion and advancement. Many valuable works are prepared and circulated, which illustrate and explain the entire routine of gardening; these, as a matter of course, find their way into the libraries of the wealthy, but are little read or valued, except by a select few. In our own country we can point to a very different state of affairs. Here, every man who spends one dollar on a tree or shrub for his door-yard, or one thousand dollars for trees and shrubs for his country-seat, desires to know what they are — how they are to be cultivated — what are their peculiar characteristics, and the probable benefit to be derived from planting them. We look upon this desire for information, as an evidence that our country is destined to advance rapidly in horticultural improvement, and to become eventually a rich and cultivated home for a vast and promiscuous family.

Our duty now, in the legitimate promotion of this general desire for horticultural knowledge, is to offer such brief hints as the limits of this article afford, upon a few topics connected with the decoration of the homestead, and the cultivation of a few choice trees, shrubs, and flowers, to add to its beauty and comfort.

It is not necessary to recapitulate what we have stated in the first number of the "ANNUAL," with regard to the preparation of the soil, and the general principles which govern all future operations. The nature of the soil, its condition as to moisture, and its mechanical texture, are points of the first importance. The condition of the soil, in regard to the chemical constituents of which it is composed, is a branch of the inquiry from which so little benefit is likely to result to the amateur cultivator, in the present limited state of his knowledge, that we must refer him to those treatises on agricultural chemistry, now so extensively circulated and read, should he desire to study that important branch of the subject.

The importance of thorough draining should never be lost sight of; full directions are already given for the management of the operation. Without thorough draining, any benefit likely to result from either

subsoil plowing or trenching are converted into partial evils, as the deep working of a wet soil renders the clay plastic, and in digging deep and wide spaces for planting trees, these are rendered so many reservoirs for water. Thus in planting orchards, no benefit, but the opposite, can arise from trenching strips where rows of trees are to be set out, while the remaining portion of the ground is left undrained and undisturbed. The first step, then, towards the improvement of the ground intended for gardening purposes, is its thorough drainage, according to such of the various approved systems as will best suit the means and circumstances of the owner.

Laying out the Grounds, or that portion of the work of improvement generally styled Landscape Gardening, demands a little more experience and skill than most of our amateurs, we fear, can personally bring to their aid. Should the place be extensive, we should certainly recommend the consultation of a practical man, qualified to superintend the work, or if more desirable, have a plan drawn up by a professional landscape gardener, and employ a handy man to execute the work. In many instances, the amateur may possess a sufficient amount of skill and taste to lay out his ground so as to please himself. Certain rules and principles have however been established and recognised as essential to the judicious fulfilment of the conditions by which art is enabled to improve and modify natural scenery. The nature of the ground to be laid out, and its situation with regard to surrounding objects, must necessarily control the operator, and determine many points.

It is generally conceded that one of the most desirable things is a good and ample lawn in front of the mansion. Where such can be secured without encroaching too much on the extent of the vegetable garden, our attention should be directed to that purpose. A main walk or approach to the front entrance, with easy and graceful curves, which after passing the front should return again into itself, is the only line by which the front should be broken up. A side or narrow walk may lead to the side entrance, and should proceed from the least obvious point of the main walk, and that concealed by a group of shrubbery.

Where the space in front of the house is very limited, and no opportunity offers for the construction of a properly curved walk, a direct approach by a straight walk must be adopted. In cases where the entire available space does not exceed more than half, or even the fourth part of an acre, very little effect can be produced, unless the grounds adjoining are so arranged as to aid in producing such effect as would be desirable. As a general rule in such cases, we should advise that the house be set as far from the principal thoroughfare as is practicable, thereby affording all the available space in front of the house for a small lawn, shrubbery, and flower beds. By a judicious grouping of the shrubs, and the concealment of the boundary fence, the apparent extent of the grounds may be greatly increased. In all cases, the space devoted to raising esculents should be concealed from view if possible, and located in the rear of the dwelling house, or at least in such a

situation as not to form a prominent feature. A low hedge, of privet or other suitable shrub, would effectually separate the vegetable garden from the lawn, where the extent of the whole is too limited to locate it at a sufficient distance from the house.

The lawn gives effect to, or destroys — according to the care displayed in its construction and keeping — the general appearance of the place. In Europe, and particularly in the British Islands, the smoothness and bright verdure of the lawn is universally admired by their American visitors. While the peculiar nature of the climate gives our neighbors this advantage, without any extra attention, it becomes us to secure, by judicious management, as good a sward as our scorching sun and clear dry atmosphere will afford. To promote the growth of choice herbage, the soil of the lawn must be in a good condition, the subsoil well drained, and the active soil well broken up and friable. A sandy loam is the most suitable soil for the production of a soft and delicate sward; in it the majority of the cultivated grasses flourish, and yet do not attain that rank and vigorous growth which is not desirable in a lawn. If sand prevails in too large a proportion, the severe droughts are apt to burn up the roots. Care must be taken to clear the ground of noxious weeds, especially of *couch* grass, the creeping roots of which, if once permitted to spread, it is almost impossible to eradicate. In trenching and digging, all such roots should be carefully picked up, thrown in a heap and burned, as every inch possesses the rudiments of a new plant. The variety of grass which has been found to succeed best in this latitude, is the Red Top, or *Agrostis rubra*. Many cultivators prefer sowing it alone, without any mixture of clover or other approved varieties, while some use about a third part White Clover and a small proportion of Sweet Vernal grass, (*Anthoxanthum odoratum;*) also Green grass, (*Poa pratensis*), and a little Timothy, (*Phleum pratense.*) Such mixtures may be purchased at the seed stores; but we should prefer to have each variety separate, if the space to be sown was extensive, and should, in view of the difficulty of procuring fresh, clean seed, depend on Red Top exclusively, which is perhaps one of the most easily obtained. Two bushels will sow an acre of well prepared ground. As it is very probable that a great variety of herbage will be produced from the so-called "Red Top" of the seedsman — we having enumerated about twenty distinct species of plants in a small space sown with that seed — prompt measures must be resorted to for their eradication in the spring, before their seeds are ripened and scattered. A boy with a strong knife may do this effectually, if attended to, and thus by a little outlay in good season secure a clean sward. After the weeds are eradicated the surface must be thoroughly rolled, which process should be repeated at intervals from the time of the vegetation of the seed until July.

The appearance of the lawn, after a good turf has been secured, will depend much on its frequent mowings during the growing season. If allowed to grow longer than two or three inches, the surface will become yellow, from being shaded. When cut, the grass should be raked

clean, and to secure neatness, swept with a twig broom. When the cut grass is allowed to lie and wither, it spoils the appearance of the surface.

PLANTING.

The judicious selection, proper grouping and careful planting of the lawn and grounds, is the next consideration. Without a variety of trees and shrubs, distributed with judgment, the most splendid mansion loses half its beauty.

The facilities now presented to the planter for obtaining choice trees, leaves no ground for neglect in this particular. Our leading nurseries are supplied with a choice assortment of such trees and shrubs as have proved hardy and popular, and a little attention at the proper season will enable any person of taste to select for himself. The points to be attended to in planting have been already fully set forth in our first number, and do not require repetition here.

We would again impress upon our readers the importance of selecting medium sized or even small trees, in preference to large ones. A tree a few feet in height, with plenty of fibrous roots, will surpass in a few years, both in size, vigor and luxuriance, a tree of eight or ten feet high, which must necessarily have its roots much mutilated in transplanting. Fruit cultivators have begun to learn this fact, after paying for their experience. Many persons who plant extensively remove indigenous trees from the woods, and are very often disappointed at their poor success. Trees growing in woods are crowded together, and when removed to exposed situations are not able to withstand the exposure; but the most important difference between such trees and those grown in the nursery is the fact of the latter being frequently transplanted, which causes them to be furnished with short and fibrous roots, as every time the roots are cut in transplanting, a growth of new fibres is produced, and nursery trees may on this account be removed without risk of failure, if judiciously planted.

Deciduous trees may be transplanted most conveniently in the fall, and evergreens in the spring. These seasons are chosen as well with reference to the facilities which present themselves at these seasons for conducting the operation — the convenient transportation of the trees to distant parts of the country, and other considerations, as the suitableness of the season itself. Much discussion has taken place on this subject, and many instances have been cited to show that trees carefully transplanted will succeed at any season from midsummer to spring. For deciduous trees, that season appears the most appropriate when the active season of vegetation is past, and the leaves are no longer spread out to be acted upon by the absorbing influence of the sun and air. We may then with comparative safety cut off the supplies from the root and transfer the tree to a new medium, where, in due time, if the necessary conditions are supplied, new channels will be created for the supply of moisture and nutriment by the time that the vital powers are again called into operation, and the thousand mouths again opened to the influence of the sun and air. It is well known, however, that

in the winter season, while a large amount of evaporation goes on from the surface of the branches, no encouragement is given for the production of new rootlets — that a long season must elapse before any relief comes to the exhausted sap vessels; while in the early part of summer, if the tree by care can be carried on for a short time in cloudy or moist weather, new roots will be produced in the more genial soil, and the tree continue to grow, notwithstanding the difficulties which it may have had to contend with.

As evergreen trees and shrubs are exposed during the entire winter to evaporation from their foliage, the spring time appears the best season for their removal. Many careful planters have succeeded better, under certain circumstances, by transplanting evergreens in the latter part of July and beginning of August. With favorable weather this may be done, but very few plant at that season. In England, where the atmosphere is very different, the planting of evergreens is carried on successfully in the summer months, and is highly recommended by many experienced writers there.

All mutilated roots should be carefully pruned off before planting, and a corresponding portion of the top must be removed to compensate for the loss of these. Let the holes be made large enough to receive the roots, without their being bent or crowded. Most of the failure and disappointment in planting arise from want of care, or negligence; better not to plant at all, than to do it carelessly. Trees must be secured from disturbance by the wind, by having stakes driven in the ground, and made fast to a straw rope round the stem, at three or four feet from the ground. Several other methods are adopted for securing trees from injury by the wind — such as surrounding them with boxes, which is also a protection from animals.

In addition to the trees already recommended for ornamental planting, we shall now name a few which have proved suitable to the climate, and are admired for their beauty of foliage and outline.

SELECT DECIDUOUS TREES.

The variety which this class of trees presents to the planter is very extensive, and affords scope for the display of taste and judgment in their grouping. Compared with evergreens, the variety available in this latitude might be calculated as ten to one; for when we set about making an assortment of the latter, of species which are really hardy, and desirable as ornamental objects in the lawn, the number is quite limited; while of the former the species may be calculated by hundreds. North America is decidedly rich in deciduous trees, so much so, indeed, that the majority of the people are so accustomed to the spectacle of lofty elms, stately oaks, tulip trees, chestnuts, hickorys, maples, buttonwoods, and many other indigenous species, that they underrate the value of fine specimens of these, and neglect to plant them about their own dwellings. This disparagement of such objects as are commonly met with, merely because they are plentiful, is an evidence of want of proper taste, and is characteristic of those only,

whose taste has not been properly cultivated. The unscrupulous axe of the clearer, if not judiciously arrested, will change the aspect of the most beautiful districts of our country, and while there is yet an opportunity, it is surely not too much to hope that in the rapid strides of improvement — in the tearing down of forests to raise on their sites cities and towns, and the cultivation of corn and wheat where the oak and pine lately flourished — enough will be spared from the devastation to preserve the aspect and the health of the favored localities, and give evidence to posterity that we could in a measure appreciate the grand and beautiful in Nature.

It may be readily conceived, that in those families of trees which include species which are indigenous and some of foreign origin, the indigenous ones prove most suitable to our climate and more generally free from disease, when used for ornamental purposes. The AMERICAN LINDEN, however, has not many advantages over the European; both are very beautiful and popular trees, and are extensively planted. The American Linden (*Tilia Americana,*) is more familiarly known as the Basswood in many districts, and is very valuable to nurserymen for its bark, which they use for strings in budding and other operations, and great numbers of these trees are annually destroyed for this and other purposes. The wood being very soft and white, is made into domestic utensils of various kinds. The tree forms a somewhat roundish conical head — not as conical or regular as the European species; both are furnished with yellowish green flowers, very fragrant, and attractive to insects. On the whole, the Linden, Lime, or Basswood, is much admired, and may be planted by all who desire a variety. Besides the two species referred to, there are in cultivation as many as eight or ten additional species and varieties — several of which are much more attractive, from their novelty, than those better known. One of the most striking of these is the BROAD-LEAVED WEEPING LINDEN (*Tilia macrophylla;*) this variety attracts the attention of all who have any eye for richness or variety in foliage. Its leaves are almost a foot in diameter, similar in form to those of the common variety, light green on the upper and downy on the under surface. When budded on an upright stem, it forms a beautiful weeping tree. The GOLD-BARKED LINDEN is another desirable variety, very conspicuous from the color of its bark. The RED TWIGGED contrasts well with the previous named, its branches being of a shining red, or rather chestnut color. There is also a cut-leaved variety, (*Tilia laciniata,*) more curious perhaps than beautiful, though very distinct from all the preceding, and on this account valuable as an ornamental tree, producing effect on the lawn when grouped with the others. From the several varieties of this single family, to which we have but briefly alluded, it may be imagined what a variety all the other families may present.

The MAGNOLIAS, with their splendid flowers and ample foliage, would require more space to do them justice than we can afford them. The more prominent species are, however, pretty well known and appreciated. The CUCUMBER TREE (*M. acuminata*) is perhaps the most exten-

sively planted, but is far surpassed in size and beauty of foliage by the UMBRELLA TREE, (*M. tripetala,*) and in beauty of flowering by *M. conspicua, Soulangeana,* and *Svecicsa.* Soulangeana is a very desirable

The Magnolias.

hybrid variety, with white flowers mixed with purple. The MAGNOLIA GRANDIFLORA is however by far the best known of the family; but it is not our privilege, in our northern latitude, to enjoy its beauty or fragrance; it luxuriates in the South, and partly makes up by its abundant flowering for the neglect which is too often apparent in ornamental planting in the favored localities where it flourishes.

The ELM family embraces many valuable species of ornamental de-

ciduous trees, several of which are indigenous, and well distributed over this continent. The American Elm (*Ulmus Americana*) still retains its place as one of the most admired of our common native trees. The Wych or Mountain Elm (*Ulmus montana*) is much admired by those who have had an opportunity to observe its beauties. It is one of the most vigorous trees cultivated for shade, and will, we have no doubt, become much more extensively planted than it now is. The Slippery Elm (*Ulmus fulva*) is another indigenous species. It is not much in demand for planting, though a very handsome tree. It does not attain a great size, but is furnished with beautiful foliage. It is well known to the people generally, being sought after for its bark, which is used for medicinal purposes. The English Elm (*Ulmus campestris*) forms a very fine looking, tall tree; its leaves are smaller than most of the other varieties of the family, but the stately form and habit of the tree recommends it. For extensive parks, where planted in small groups, it is very striking. The Smooth Leaved Elm (*Ulmus glabra*) has not been much planted. The Huntingdon Elm, a variety of it, is one of the prettiest of the family. As few full grown specimens are to be met with, of the more new and rare varieties, their attractions are not seen to advantage, so as to create a desire for them. Enterprising and improving planters, however, introduce these novelties into all districts of the country, and a few years will bring many fine objects before the people, in a form which will prove more encouraging than mere descriptions and recommendations. The Variegated Leaved Elm is one of the more recent introductions, and will, we have no doubt, be much sought after when known. The Nettle Leaved Elm is also comparatively new, and very distinct. The Fern Leaved Elm is also curious on account of its cut foliage, and is a desirable variety.

In addition to the varieties named, there are several Weeping Elms, which, when planted on the lawn, form beautiful and appropriate objects. One of the best is the Camperdown Weeping Elm, comparatively new here, but very handsome. The Weeping Mountain, or Wych Elm, forms a beautiful tree for the lawn, and is becoming very popular. Several other varieties may be found in collections and nurseries, but those now alluded to will suffice to choose from. In many cities, the Elm is extensively planted as a shade tree, and the beautiful rows of these, which ornament the streets of New Haven, Connecticut, have gained for that city the appellation of the "City of Elms."

The Horse Chestnut family affords several desirable varieties, some of which are quite popular already, although of comparatively recent introduction. The species best known is what is called the English Horse Chestnut; it is not, however, originally indigenous in that country. Within a few years this tree has become very generally known, and is planted to a great extent. It is fully deserving of the favor bestowed on it, as it is one of the most beautiful of our introduced trees. It is not so desirable as a shade tree as it is for planting on the lawn, as it is not of a spreading habit, being more inclined to form a round head; its ample dark green foliage, however, renders it

very attractive and refreshing, and its beautiful pyramids of white flowers, slightly tinted with rose, which appear early in spring, render it still more pleasing. There are, in addition to this the best known individual of the family, as many as eight or ten others, some of them hybrid varieties, with distinct foliage and flowers. The DOUBLE WHITE is a variety of the last, with double flowers, and foliage similar to that of the single variety. It has not yet become generally known, and is still scarce. The RED FLOWERING (*Æsculus rubicunda*) is a choice species, with red flowers, as its name implies, and dark green foliage: a very desirable tree. WHITLEY'S SCARLET is a variety of the last, with flowers of a brighter color, and somewhat different foliage. There is also a variegated variety, as well as several others which we cannot notice at present.

Few objections can be made to the Horse Chestnut. It is not subject to disease, and is not preyed upon by insects. Some complain that it is a tree of slow growth, which, when compared with more common shade trees, is perhaps true. The beauty of a fine specimen when full grown will make up for this deficiency; and as many fine specimens are to be seen around our cities, it has become a general favorite. Its fine glossy nuts, which are enclosed in a rough case, are much admired, and though produced in abundance, have not been found of any value as food, — though they have been recommended for hogs, after the crude juice which they contain has been neutralized by some process of cooking. Whether any great benefit will accrue from their use is not yet clearly ascertained; at present, nurserymen raise young trees from the nuts, which in some parts of the country may be sold for this purpose when young and sound.

The OHIO BUCKEYE, one of our characteristic American trees, belongs to this family, and is so well known as to require no description. The YELLOW BUCKEYE, though very similar to the last in appearance, belongs botanically to the *Pavia* family. The species of this family differ in appearance from those of the *Æsculus*, or true Horse Chestnut, in the lighter green of their foliage, which is also generally smaller in size, and in the habit of the trees when full grown, which are not so spreading, but of a more erect and conical form. The leaflets are also of a different shape; those of the Horse Chestnuts are obovate, or nearly wedge shaped, while those of the Pavias are elliptical and acute at both ends. The RED FLOWERED and FLESH COLORED are the two most important species, in addition to the Yellow Flowering, (*Pavia flava,*) already alluded to.

The MOUNTAIN ASH, next to the Horse Chestnut, is perhaps one of the most popular ornamental trees, in those districts suited to it. In cool northern latitudes it forms an attractive object, and is largely planted. There are objections to it. In many districts it is attacked by the *borer;* belonging as it does to the *Pyrus* family, this is to be expected, though in some localities it is almost exempt. There is an American variety, as well as the European. They are very similar in their appearance, yet they may be readily distinguished. The European is the

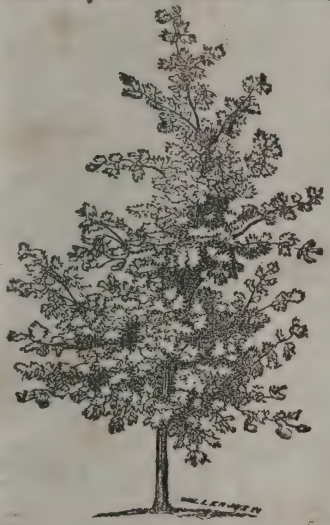
most desirable, though some believe that the American variety is the more hardy. Both are furnished with white flowers and bright scarlet berries; though from the failure of some trees to produce these regularly, it is believed by some that only one variety bears berries, and wish to plant that one of course. The failure to produce berries arises from some defect in the soil or situation of the tree, and depends on adventitious circumstances. The OAK LEAVED MOUNTAIN ASH is quite distinct from the common, with broad foliage lobed like that of the Oak. There are several trees of this family which should be noted here.

The FLOWERING ASH, (*Ornus Europæus.*) Though not very desirable — as we scarcely believe it would flourish in our climate as well as many other trees, more easily propagated — yet on the score of variety

The Flowering Ash.

it may be introduced here. The foliage resembles that of the common Ash a little; but the tree, when full grown, is of a roundish conical form. The cut represents a branch with a spike of flowers, which are of a yellowish green, emitting a peculiar odor.

The PYRUS ARIA, or White Beam Tree, with its distinct foliage, downy and white on the under surface, is desirable as a flowering tree. PYRUS DOMESTICA is the Service Tree, a very pretty flowering tree, producing showy berries in corymbs succeeding its white flowers. We shall only add the DOUBLE FLOWERING APPLE, (*P. spectabilis*,) perhaps the most desirable of the family, at least the most beautiful when in bloom, and can highly recommend it to all who are not familiar with it, as a choice flowering tree.



Liquidambar Styraciflua.

The LIQUIDAMBAR STYRACIFLUA, or *Sweet Gum*, is one of our pretti-

Leaf and Flower.

est native trees. It should be more cared for than it is, as its habit and foliage are both distinct from all our common trees.

The ROBINIA, or LOCUST tree, of which there are many varieties, is much admired and valued. The YELLOW LOCUST is the best known, being one of our most abundant native trees. By some, this old familiar friend is no longer esteemed, since newer and more rare objects have superseded it; yet to many a handsome, shapely tree, when in bloom, is still beautiful. The ROSE ACACIA, (*Robinia hispida*,) when in bloom, is decidedly beautiful; its long racemes of flowers, of a delicate rose color, are very attractive.

The GUM ACACIA (*Robinia viscosa*) is also rose colored, but distinct from the preceding by its gummy branches and pods.

The GLOBE ACACIA forms a beautiful round headed tree, well adapted for the lawn, and with graceful branches and foliage.

Several new varieties are in cultivation, which we shall speak of when better known, such as *R. Bessoniana*, said to be one of the finest of the family.

The Beech, of which there are at least three choice varieties, must not be omitted in our selection. The Cut Leaved is very distinct and graceful. The Purple Beech is also much admired for the contrast it makes with the more common trees.

The common Beech.

The Maples are now so well known, that we need only enumerate the varieties as being necessary to an assortment. Two species, the Silver Leaved and Sugar Maples, are more extensively planted as shade trees, than perhaps any two others. In Philadelphia, where the appearance of the strects and the comfort of the citizens are well cared for, the Silver Maple is the predominating shade tree; it has almost entirely supplanted the once popular but now neglected Ailanthus. Many good sized trees of the Silver Maple are to be seen in various parts of that city, the seeds of which are collected and sown by nurserymen to supply the annually increasing demand. The light clean foliage of this species is much admired by some, and is chiefly valued on account of its comparative freedom from insects, at least when compared with the Silver Poplar and Lindens. In other cities and districts, the Sugar Maple is more extensively planted. This also forms a handsome and desirable shade tree, and by some is much more highly prized than the Silver. It is very attractive in the autumn, on account of its bright yellow foliage when changed by the advance of the season This is a feature which must be taken largely into account by planters, as the bright and varied autumnal tints are proverbially attractive, and

prized by our people as characteristic of the country — presenting to the stranger a most striking and beautiful sight, remembered generally when all other impressions have been removed. To this feature the Sugar Maple contributes in a great measure, as do also several other species of this family. The NORWAY MAPLE (*Acer platanoides*) is now much in demand as a shade and ornamental tree; its broad foliage is its chief recommendation, which, in addition to its hardy character, (being from a northern European latitude,) render it at once beautiful and useful. We expect to hear of an increased demand for this species.

Very distinct from all of the above is the PURPLE LEAVED MAPLE, with reddish purple foliage, somewhat similar in shape to that of the Sugar Maple, but the tree is much more rare, and not yet sufficiently known to be in general demand. Our space will only permit us to name, in addition to the above, the STRIPED BARKED, CUT LEAVED, and MONTPELIER MAPLES, — all of which are desirable where variety is sought after. We must not, however, entirely overlook the SYCAMORE, (*Acer pseudo-platanus*,) which, though very popular in Europe, has been sparingly planted in this country. It is a very beautiful tree when healthy — inferior, in my opinion, to none of the family in its aspect.

The THORNS, of which there are a great many varieties, though very desirable, do not succeed as well as from their beauty could be wished. One cause of this, is the difficulty of transplanting, as the roots are easily injured and impatient of exposure; they spread themselves to a great distance from the stem, and are not easily preserved in digging. Although there are in cultivation, in some of our nurseries, upwards of twenty species and varieties, we seldom meet with more than three or four kinds in gardens. The common WHITE THORN, or HAWTHORN, (*Cratægus oxyacantha*,) is the best known of the family. It is not well adapted to our climate, which is too dry and hot for it. It has been employed in different places as a hedge plant, for which it is famous in Britain, but with only partial success here. It is proverbially fragrant, and has been spoken of by a favorite poet of its native country, as "The milk white thorn that scents the evening gale." The SCARLET FLOWERING is a variety of this, which is a very fine ornamental tree. Also the DOUBLE WHITE and DOUBLE RED, are great favorites.

Several species of ASH will be found appropriate objects in a collection of trees. The WEEPING ASH is peculiarly attractive, and in addition to the well known common European weeping variety, (*Fraxinus excelsior pendula*,) the WEEPING LENTISCUS LEAVED ASH is well worthy a place.

The BIRCHES are graceful, airy trees, with smooth shining bark, which in some is of a beautiful creamy white color; they make beautiful trees for the lawn, as single specimens. The CUT LEAVED WEEPING BIRCH is the most graceful of the family.

The KOLREUTERIA is much admired for its panicles of yellow flowers and seed vessels which succeed them. It is also desirable on account of its entire dissimilarity to other trees, being of a unique character.

The PAULOWNIA IMPERIALIS is famous for its ample foliage and beau-

tiful flowers. It is not, however, sufficiently hardy to bear our severe winters in this latitude, as the past unusually trying one cut down some large specimens.

The GINGKO TREE (*Salisburia adiantifolia*) is very peculiar in its appearance, and well suited to produce variety in an extensive collection. The finest specimens of this tree, which when full grown is very upright and striking, are to be found near Philadelphia. Several trees in the Woodlands near that city have been justly admired by many visitors, attracted thither by the noble specimens of arboriculture which are there to be met with.

We cannot conclude our notes of deciduous trees, without referring to a few more interesting objects.

The VIRGILIA LUTEA, or YELLOW WOOD, which is now much in demand, must not be omitted. It is a flowering tree of the leguminous tribe, to which our Locust tree belongs, and furnished, like it, with long racemes of pea flowers, of a creamy white color; the foliage differs materially from that of the Locust, and the habit of the tree is much more desirable. Although a native of this country, it is not generally known or distributed, and only a few large specimens are to be found in the Northern States. Now that it has been brought into notice, it is hoped supplies will be furnished from its native localities in the Southern States, so that our countrymen may no longer be compelled to send to Europe for a tree a native of our own forests.

Several WILLOWS remain to be noticed. The ROSEMARY LEAVED WILLOW is universally admired for its vigorous and graceful habit; its leaves are of a dark green on the upper and white on the under surface, similar in shape to those of the common Rosemary of the gardens, from which it takes its name; grafted on an upright stem, nothing can be more beautiful than a good sized specimen standing on the lawn. The new AMERICAN WEEPING WILLOW has more slender branches than the preceding, which hang gracefully to the ground, clothed with delicate foliage. A number of choice varieties have been introduced, which we have not now an opportunity to particularize.

SELECT EVERGREEN TREES.

What a different aspect the lawn presents, when furnished with a few evergreens to take away its naked appearance, and afford protection to the mansion in winter, when the deciduous trees are no longer efficient. The desolate look which most of our farmers' homesteads present to the traveler, could be changed effectually to one of comfort and shelter, merely by the addition of a few Norway Spruce or Balsam Fir trees. And how much more pleasing is the sight of a dwelling house in winter, shielded thus from the searching winds, than the naked, exposed farm house, destitute of verdure which could be supplied by very little labor or expense. We flatter ourselves that no farmer in our day would build a house, and lay out his farm, without recollecting that a little protection in winter would add comfort to his family, and give to others a better opinion of himself. And when we

consider how easily such a benefit may be secured, we can only marvel at the neglect which has too long prevailed among our rural population. Until the desire for a few choice shade and ornamental trees, with a few hardy evergreens, is felt by the majority of our farmers and all who own a plat of ground, the benefit which may be expected to result from attention to arboriculture will fail to be realized.

We shall only refer to a few of the more useful evergreens, which are suited to the circumstances of our readers.

The NORWAY SPRUCE we have frequently recommended as the most desirable of our common evergreen trees, and the extent to which it has been planted, proves that it is fully appreciated.

The WHITE SPRUCE is in some situations a very handsome tree, when it assumes the weeping habit, and is furnished with its numerous cones.

The HIMALAYAN SPRUCE (*Abies Smithiana*, or *Morinda*,) is a variety somewhat resembling the Norway, but of a lighter green foliage, more densely set on the branches, and gracefully pendulous; its habit is peculiarly attractive. We have not seen full grown specimens, but from the appearance of the young trees, we are fully satisfied that it is one of the most beautiful of our evergreens.

DOUGLAS' SPRUCE (*Abies Douglassii*) is also of comparatively recent introduction, and though upwards of thirty years in cultivation, few large specimens can be found in this country. Those who desire a variety of coniferous trees cannot omit this American species, one of the noble Western Pines for which that part of the continent has become noted. It bears the name of the celebrated traveler DOUGLAS, and will serve as a monument of his industry and enterprise.

The MOUNT ATLAS CEDAR, or Pinsapo Spruce, is another desirable species of the same family, quite distinct in appearance from those already noticed.

The CEPHALONIAN SPRUCE forms a beautiful tree, with spreading horizontal branches, and stiff, silvery leaves, very regular in its form, and vigorous in its growth.

The Spruce family contains several other species, which may be noticed at a future time.

In addition to the common BALSAM FIR, now so universally known and planted, several novelties have been introduced, which belong to the same family, *Picea*.

The European SILVER FIR we need not describe, as it is also familiarly known to most planters. Two splendid trees have been introduced to cultivation from Oregon and California, which deserve a passing notice. PICEA NOBILIS is one of the finest coniferous trees known, and when sufficiently disseminated will be regarded as a decided acquisition. PICEA GRANDIS, from the same district, attains a great height, and is recommended as one of the most valuable of recent introductions.

PICEA WEBBIANA, from the Himalaya mountains, somewhat resembles the Silver Fir in its foliage; it is a much more beautiful tree, however, but scarcely hardy enough for our northern latitudes.

Many of these rare coniferous trees survive our winters, yet do not flourish or grow with that luxuriance necessary to develop their natural form or beauty. On this account they are not suited to the majority of our planters, and when planted indiscriminately amongst other trees do not give satisfaction. Though we should not fulfil the purpose in view, were we to confine our remarks to those species only, which are well known and perfectly hardy, yet we would not recommend any of these rare evergreens to those who have not already some experience wiih the older and popular sorts.

The family of the ARBOR VITÆ (*Thuya*) includes several familiar trees, such as the American Arbor Vitæ, (*Thuya occidentalis,*) to which the name of White Cedar is erroneously applied by some. This is at all times useful in laying out a place, for the purpose of screening unsightly objects, and is also used for a hedge plant where effect only is desired, and not a barrier. We give a cut of a beautiful specimen, growing on a lawn in this city.

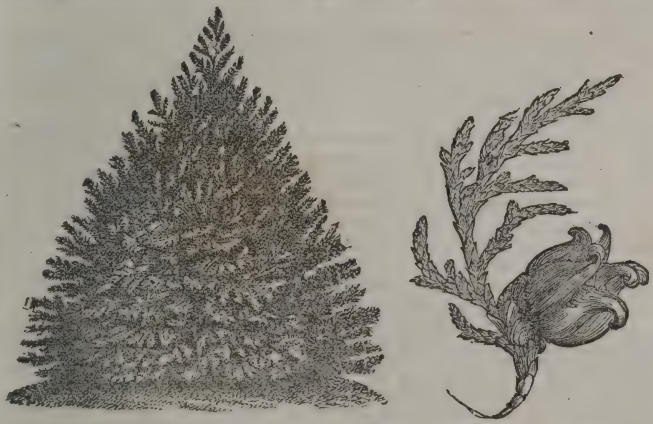
The American Arbor Vitæ.

The CHINESE (*orientalis*) is also extensively planted, but is rather stiff in its habit for general purposes. It becomes quite brown in winter, but soon recovers its verdure in spring.

THUYA PLICATA is a very desirable species, somewhat resembling the American, but of a brighter green, and the foliage more dense. It is a native of the north-west coast, and by authors believed to be a variety of *Th. occidentalis.*

The SIBERIAN is of comparatively recent introduction. We have not seen it identified with any of the species described in scientific works on Conifera. The individuals commonly known as belonging to the

family of Thuya have been divided by some authors into the families of *Biota* and *Thuya*. To Biota is referred the species which have *ovoid* seeds, while to Thuya those which have compressed seeds are referred. The Chinese Arbor Vitæ (*Biota orientalis*) is the type of the Biota section, and *Thuya occidentalis* — the American Arbor Vitæ — represents the other. The description which agrees most closely with the Siberian, is that of the *Biota pyramidalis*, a species which is a native of northern Asia, and which has been considered only a variety of the Chinese; one of the best authorities, however, is satisfied of its being a distinct species. The Siberian, as seen in our pleasure grounds and nurseries, is a tree of perfectly pyramidal form, broad at the base, with flat branches very densely set around the stem. It withstands the extremes of our climate better than any other variety, and is less liable to become brown in the foliage. The annexed cut is taken from



Habit and Fructification of Siberian Arbor Vitæ.

one of the largest specimens in the vicinity of Rochester, as the plants are still young, having only been introduced about ten years. It is likely to become one of the most popular of the Arbor Vitæs.

The Golden Arbor Vitæ, *Wareana, pendula*, and several others, are well worthy the attention of amateurs who have sufficient space for a diversity of trees and shrubs.

Among the well known family of the Junipers, to which our favorite "Red Cedar" belongs, there are besides it several choice species. The Swedish Juniper, as well as its companion the "Irish," form beautiful objects in proper situations, but judgment is necessary in locating them, as they are of a very formal character. For cemeteries they are very well suited, as there is none of that lively expression in them which is characteristic of trees or shrubs with spreading or irregular branches.

The Savin (*Juniperus Sabina*) is peculiarly attractive to some, and is on the whole a choice species; its dark hue contrasts well with the preceding, and its spreading habit renders it more suitable for indiscriminate planting.

In addition to the species above referred to, there remain of this family the Common Juniper, (*J. communis,*) of which some suppose the Swedish to be but a variety. Treatment alters in a great measure the form and appearance of these trees; in some instances the Common Juniper is very irregular in its shape, while we see it very compact and upright in others. The Swedish is generally an upright, dense tree, unless rendered otherwise by accident, and the Irish variety is still more so. Some cultivators aim at giving this habit to the Junipers, and they are much in demand for lawns when grown in this way.

Several others could be added, but those already noted are the most useful.

The White Cedar (*Cupressus thuyoides*) is much admired by some. It varies very much in habit and appearance; when grown luxuriantly, in a suitable soil and situation, it forms a fine looking tree, though of a slender habit generally. It is found abundantly in Pennsylvania and other Middle States.

There are several beautiful species of Cupressus in cultivation, which are, we regret, too tender for our Northern and even Middle States. One of these — the Japan funebral Cypress — is a graceful, pendulous evergreen tree, admired by all who have had an opportunity of seeing its natural habit. In the Southern States it should become very popular, were the people there alive to the advantages which a genial climate confers for the cultivation of those noble specimens of the trees and shrubs of other continents, which cannot, by any system of acclimation, be rendered available in our northern arboretums.

Of this class also is the Japan Cedar, (*Cryptomeria Japonica,*) which, after its introduction to this country, was watched with anxious solicitude for several seasons. Specimens in Pennsylvania survived the opposite effects of sun and frost, until it was pronounced "hardy;" but it has not been able to maintain its reputation. It cannot longer be fairly represented as a hardy tree, in the Middle or Northern States. Yet, as a green-house or tender *shrub*, it is still attractive; and when planted in tubs, to be set out around the mansion in summer, either *plunged* or as a prominent object, it cannot but command attention. When too large to be transferred in this way from winter to summer quarters, and *vice versa*, it must of course be "cast out."

In the same category we are constrained to place many other favorite half-hardy evergreens. The *Araucaria imbricata*, or Chili Pine, can never raise its geometrically disposed branches in our lawns, to the height of seventy or eighty feet. We must make the tour of Europe to see it thus,— only to return with regret, or rather to rejoice, that while our climate will not rear the Chili Pine, Japan Cedar, Funebral Cypress, or Deodar Cedar, it favors the luxuriant growth of the White Pine and Hemlock Spruce — enriches our forests with noble specimens

of Oak and Walnut — covers our arbors with grateful bunches of Isabella and Catawba grapes — fills the farmers' cribs with ears of golden corn, and their cellars with choice apples and luscious pears.

The YEW family, of which there are about ten species and varieties, includes only three or four which we can at present recommend. The common ENGLISH YEW has been described in the first issue of this work, as well as the UPRIGHT or IRISH variety. These, in our climate, are rather shrubs than trees, though in their native country some specimens have attained the size of trees, and are famous for their advanced age. Their very dark green foliage, and the columnar habit of the upright variety, render them suitable for cemetery decoration,— though the English Yew has been found in church-yards from time immemorial, and is supposed to be selected for some traditionary reasons.

The Irish Yew.

The varieties of the English Yew (*Taxus baccata*) which are most interesting, are *Dovastonii* and *Elegantissima*. The Dovastonii has pendulous branches, and Elegantissima has foliage with gold stripes. *Adpressa* is another desirable variety, with peculiarly round, dense foliage.

The number of new tender or half hardy evergreens greatly exceeds that of the hardy ones. Additions are periodically made to the list, by the importation of novelties from European gardens. Of these we may here mention the *Abies Jezoensis*, *Fitzroya patagonica*, and *Saxe-Gothea conspicua*. These names are not by any means euphonious to American ears; but as it is by European enterprise that these novelties are discovered and introduced, and as the rules of science authorise the party who classifies and describes a plant to fix the name, we cannot reasonably reject them. The three plants in question are very highly spoken of, and when properly treated are handsome evergreens, yet for our purpose will not be considered desirable.

Another family demands attention here. The TORREYA, or FLORIDA YEW, so named in honor of Dr. TORREY, the leading American botanist.

The YEW-LEAVED TORREYA (*Torreya taxifolia*) is the best known species of the family. The largest specimen we have seen was that in the nursery of the late THOMAS HOGG, Esq., of Yorkville, N. Y. This veteran horticulturist pointed to this specimen with pride; though he was by no means easily taken up with novelties, he had a true appreciation of the really beautiful and useful in plants, and considered the Torreya an acquisition. While we are reminded of the fact, we hope it may

not be deemed out of place to state, that the introduction of many of our best trees, plants and flowers, is due to the enthusiasm and perseverance of Mr. Hogg, who, at an advanced age, was called from the scene of his pleasing operations, in October, 1854. The Torreya taxifolia is a native of Florida, and is hardy in this latitude, in suitable situations. It is a tree with broad, shining, Yew-like foliage, with a habit distinct from our common evergreen trees.

Torreya myristica is a California species, with very peculiar, nutmeg-like fruit — which misled some of our smart Californians into the notion that that remarkable soil had produced a veritable "Nutmeg tree." We find that the editor of the *Horticulturist*, who doubted the statement some months ago, has just discovered that the Nutmeg tree of the California papers is the *Torreya myristica* of botanists — a fact of which we gave him due notice when the original paragraph appeared. The fruit of the true Nutmeg tree (*Myristica moschata*) is *ruminated*, which is also the characteristic of the Nutmeg-fruited Torreya. We hope the Anglicised title may not prove inconvenient; we prefer the scientific name, as we are not disposed to call it the California Nutmeg, which leads to misconception.

The "Big Tree," as the giant of evergreens has been familiarly styled by its Yankee countrymen, has ensured for America the reputation of producing, in a circumscribed district of its "gold region," the marvel of arboriculture. It is now many years since uncertain reports of the existence of evergreen trees of an extraordinary size reached European botanists, by means of collectors and travelers in Mexico and Central America. Much discussion arose as to the identity of trees of which only drawings or imperfect specimens had been received. A few years ago, a collector, Mr. Lobb, sent home to the firm by which he was employed, authentic specimens and seeds of a tree which has since proved to be not only hitherto unknown to botanists and arboriculturists, but, as has since been determined, strictly local in its *habitat*, and confined to the San Antonio valley, where the original trees were discovered. And it is with pride and satisfaction we state that, unaided by any grant from Congress or Government, but by individual enterprise, thousands of this new and wonderful tree are now to be found in our own vicinity, raised from seed obtained from the original specimens. Many have been also exported to Europe, where, despite of reason or common sense, the name of the great British Hero has been conferred, by a scientific botanist, on this giant and noble product of American soil — as if we had no Hero in our history worthy of the commemoration. The "Big Tree," however called *Wellingtonia gigantea* by Lindley, can never be styled so by the American citizen. Some have substituted that of *Washingtonia gigantea*, while others adhere to an older but incorrect title, *Sequoia gigantea*. A brief description is all we can afford of this noble specimen of California products.

This tree has been known for about thirty years. It was discovered in the District of Sierra Nevada, near the source of the San Antonio river, in 38° of north latitude, at an elevation of nearly 5000 feet above

sea level. The branches are pendulous; leaves in three alternate rows, imbricated, appressed, oval lanceolate, with a sharp coriaceous point, color light green; cones oval with scales, each covering seven seeds. The most accurate description was furnished by Mr. W. Lobb, botanical collector, who sent specimens of the branches and cones to England. Some of the specimens he saw, reached the height of three hundred feet, and the trunk measured thirty feet in diameter, at three feet from the surface of the ground; at eighteen feet from the base, a section measured fourteen feet in diameter; the bark was from twelve to fifteen inches in thickness; and a section which had been hollowed out was twenty-one feet in diameter, affording sufficient space to seat forty persons and a piano. The age of such a specimen, calculating by the zones of wood, is estimated at three thousand years, or one inch in height for every ten years of its estimated age.

The "Big Tree" of California.

M. Naudin, in an elaborate article in the "*Flore des Serres*," on the discovery and history of this tree, has the following hints for the Government of its native territory, which we have translated, and deem them worthy insertion here:

"It would seem," says M. Naudin, "from the accounts that we have cited, that the great specimens of this tree are not numerous, and that the species is even circumscribed within narrow limits. If the government of California had any appreciation of the picturesque beauties of Nature — if it understood its duty towards the Men of Science, Poets and Historians of the future — it would take care not to permit the destruction of these rare and marvellous monuments of the vegetable kingdom, which might one day afford a solution to a question interest-

ing at once to physiologists and geologists — the origin of species, and even that of man himself. Before such considerations all the cupidity of individuals should give way. It is also the duty of men of intelligence in that country to make their fellow citizens understand that the public interest is not exclusively limited to the pursuit of lucre and discovery of gold mines; and that a nation progresses as much and perhaps more by intelligence and knowledge than by material wealth. A government adds honor to itself, by favoring the noble instincts of Science, Art and Poetry, and it fulfils not its mission at the present day, if it neglects to guard the interests of moral order, no longer confined to the people of which it has the care, but extended to mankind."

Such are the ideas which the destruction of some of the noble specimens of the "Great Tree" created in the mind of a French lover of natural productions, and who — living as he does under the domination of an Emperor — forgets that the Government of California has but a limited authority over the citizen, and dares not dictate what trees shall be cut down, or what shall be left standing, — unless, by actual purchase or cession, the soil on which they grow belong to it as a body. That by exerting a wholesome and timely influence on the owners of the soil, such natural curiosities might be preserved, there is no doubt, at least in a society even partially civilized. Our Yankee countrymen much prefer cutting down such trees, and turning them into dollars and cents, either by cutting them up into lumber or fire-wood, or, *Barnum-like*, exhibiting for a "quarter," to the lovers of the marvellous, in our populous cities, a section of a tree, — while to see the original growing in its native majesty, is worth one hundred fold that sum. Pearls are still cast before swine, notwithstanding the advice of the Great Teacher.

From the great elevation at which the trees have been found growing, and from the low temperature prevailing there, it is hoped the young trees now flourishing in our nurseries will withstand the winter here. In England they have proved hardy, though — obviously from some defect in their management, which the sapient LINDLEY has not yet clearly explained — many plants have become sickly in the nurseries there. The plants at present in the hands of several nurserymen in this country, have been raised from seeds obtained from the original grove in California, collected by travelers from the Northern and Eastern States. The plants — some of which we have seen — are from eighteen inches to two feet high, and beautifully symmetrical in their habit; the foliage is of a glaucous or light bluish green, resembling somewhat a White Cedar, or Red Cedar.

From the same country we have obtained several other evergreens, which, if they prove hardy, are valuable. *Thuya gigantea*, called also *Libocedrus decurrens*, is a beautiful tree, with delicate light green foliage, and is considered one of the finest of California evergreens.

Cupressus macrocarpa is also new, introduced at the same time as the above.

Many choice trees and shrubs, suited to the climate of the Southern

States, should not be overlooked. One of these, *Libocedrus Chiliensis*, was much admired when introduced a few years ago. Its foliage is flat, of a silvery green color, and peculiarly distinct, as it seems marked with white dust on the leaves. It is tender, and not adapted to the Northern States, except as an in-door shrub, in winter.

Had we space, we should notice such additional evergreen trees as have been introduced to our collections, or are to be found in our nurseries, and are really worthy attention; but this would extend this article much beyond the limits assigned to it.

We reluctantly close this chapter on Evergreen Trees, being obliged to omit many favorites, and proceed to note a few

DECIDUOUS SHRUBS.

The line which divides the shrub from the tree is not well defined in practice, and is in many cases arbitrary. What are trees in their native country and under suitable management, here, in many instances, only attain the size and have the appearance of shrubs. The distinction, however, is easily ascertained, by comparing the characteristics of each, as scientifically defined.

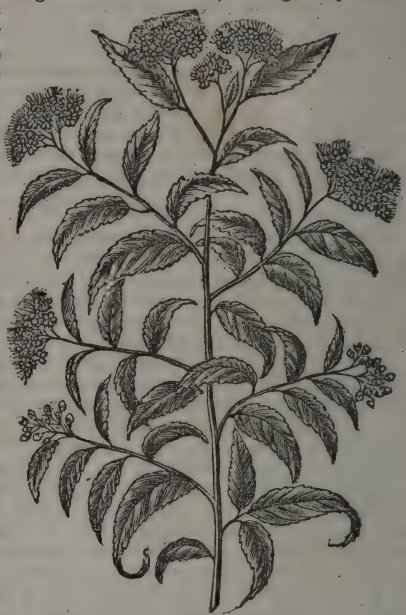
A shrub is a perennial which sends forth branches from the root, or descending stem, without any intervening trunk. The *Spiræas*, *Deutzias*, *Laurels* and *Azaleas*, are appropriate examples. While there need be little or no misconception as to what is a shrub or what a tree, if formally developed, there may be some, with inexperienced observers, when the subjects are stunted or but partially developed. Trees, natives of other countries and in different latitudes, display a great dissimilarity of character when transplanted to an ungenial clime; we may therefore claim exemption from the charge of error on this point, should we have introduced what are, strictly speaking, trees, as shrubs, or *vice versa*. The slow growing or stunted tree serves all the purposes of a shrub in many instances, and may not during the life of the planter show itself worthy of any other title. Many of the smaller coniferous trees are substituted for shrubs, and so designated in practice, without any serious inconvenience; yet a shrub can never, by any transformation, strictly speaking, become a tree; nor can a tree, furnished with its distinct trunk, ever dwindle to a shrub.

Having, in the first number of the "ANNUAL," noted some of our most useful deciduous flowering shrubs, we need not go over the ground again, but add such as have been more fully tested or recently introduced.

Among the SPIRÆAS, which are now very numerous, we have to notice the DOUBLE VARIETY of REEVESII, which fulfils, as far as it has displayed itself, the high expectations regardiing it which were formed from foreign descriptions. It is really a delicately beautiful and choice addition to the list of Spiræas.

SPIRÆA BILLARDII is of recent introduction; flowers of a bright red color; not yet sufficiently known here; it is a hybrid between *salicifolia* and *Douglasii*.

Spiræa callosa has fully established its character as one of the most desirable of the family; its bright crimson flowers, in large corymbose panicles, free blooming tendency, and distinct bronzy foliage, render it at once beautiful and peculiar. The annexed cut will convey an idea of its appearance.



Spiræa callosa.

Those who prefer well tried, free blooming, and popular varieties, are safe in planting *S. prunifolia pleno*, *S. Reevesii*, or *lanceolata*, (see cut on next page,) *S. Niconderti*, and *ulmifolia*. The last mentioned has broad leaves and large trusses of white flowers.

Spiræa sinensis is also well worthy a place in the shrubbery; it is a profnse bloomer, with light green foliage, very distinct from the others noted.

We cannot pass over Deutzia gracilis without again recommending it as one of the most desirable of dwarf flowering shrubs. Its pure white flowers, crowded on the delicate branches, attract the attention even of the unskilled passer by. It is also one of the most suitable shrubs we possess, for pot culture and early forcing.

Deutzia crenata much resembles the preceding, but is of stronger habit.

A new variety, D. sanguinea, with pink flowers, has been introduced.

Weigelia rosea is now so well known to all amateurs, that we may safely recommend its younger brother Weigelia amabilis; this is now acknowledged to be more beautiful than the former, and at all events desirable for comparison.

We have not seen enough of Weigelia splendens, to speak with confidence of its merits. A spurious variety was imported for it, from France, which proved to be our native *Diervillea lutea*, as noted in the first number. The true *W. splendens* is a very showy variety.

The Weigelias are also well adapted for forcing, and make beautiful plants for the greenhouse or conservatory, in spring, when there is a

paucity of flowers. With a few neat plants of the choice varieties of Spiræas, Lilacs, Deutzias and Weigelias, an abundant supply of flowers for bouquets may be had in the greenhouse, during the months of March and April, in advance of the out-door flowers.

Several handsome varieties of Lilac (*Syringa*) may be noticed. Syringa speciosa is a variety of a much darker shade than the common, and its thyrses of flowers much more compact.

The Double Flowering Purple is a novelty to many, and well deserving of a place alongside its older and better known original.

The Syringa Rothmagensis resembles the Persian, but is darker in color, and has a larger thyrse of flowers.

We must be excused if we hurriedly glance over the rich display of flowering shrubs that a rich collection presents to the tasteful observer; yet we cannot omit to particularise the Tamarix, with its slender, heath like foliage, and delicate pink flowers, which clothe its slender branches. There are several species, all closely resembling each other in outward appearance.

Spiræa lanceolata.

The Oleaster (*Eleagnus hortensis*) must also have a passing notice; its foliage remains very late on the branches, and has a very peculiar white and downy surface.

The American Euonymus, or Spindle Tree—also erroneously styled the *Strawberry tree*, a name by which the beautiful *Arbutus unedo* is familiarly known—is remarkable, clothed with its crimson fruit when the surface beneath is covered with snow. Such a shrub—or as we should more properly say, tree—is worthy a place, for this attractive sight alone.

EVERGREEN SHRUBS.

It is not within the scope of these brief memoranda, to include the various shrubs which have been recommended by enthusiastic amateurs and experimentalists, for the decoration of the lawn, in winter by their permanent foliage, and in spring and summer by their flowers of varied and gorgeous hues.

We have heard of the successful cultivation, even in this northern

State, of the RHODODENDRONS PONTICUM and CATAWBIENSE, with their numerous varieties; but as yet they are but rarely seen, and cost too much care and foresight to suit our rapid cultivators.

The ROSEBAY, or MOUNTAIN LAUREL, (*Rh. maximum*,) may flourish in its native haunts, a little farther south; but there it is to be sought, if we would see it in its beauty. The KALMIA may grace the American gardens of foreign horticultural societies, but seldom comes to the relief of our bare "front garden." And so it may be reported of other native evergreen shrubs, too *common* to claim attention. Wanting these, and many others which might be made available, our catalogue of choice evergreen shrubs, capable of withstanding our winters and more destructive summers, is meagre indeed. So meagre, that the majority of our less critical planters are content with the Norway Spruce and Balsam Fir, or the Chinese Arbor Vitae, Red Cedar and Juniper, with occasionally an English Yew, as substitutes for evergreen shrubs, to decorate their lawn, in front of the dwelling-house.

We shall not now state our ideas as to the neglect of cultivating and rendering familiar to the people, those choice and beautiful evergreens which are so profusely scattered all over the country. It would, perhaps, be presumptuous in us to say that such a duty belongs to some of our organized societies, established for the promotion of horticultural improvement. Let us be content to recommend, as before, such shrubs as *Mahonia aquifolia*, *Euonymus japonica*, (which latter, unfortunately, is severely cut up at times, and looks very shabby at the commencement of spring,) *Pyracantha*, or Evergreen Thorn, BOX TREE, *Cotoneaster microphylla*, and the EUROPEAN HOLLY, if it can be kept alive. The AMERICAN HOLLY, if not too common or unprofitable, might also be included if it could be obtained, — and we believe it can, for seeds of it have been sown of late in quantities.

But why should our northern "Country Gentlemen" — if that title be not offensive — desire to see their homes decorated with objects destined only to flourish in the more genial South? Simply because science teaches them that the influence of climate may be modified, and that human intelligence can, if it will, achieve all that is within the bounds of natural law. We hope that the enthusiasm of a few individuals, who have exerted themselves to prove how much can be done to increase the list of ornamental evergreen shrubs suitable to this climate, will not be spent in vain, and that many will accomplish what a few such as H. W. SARGENT have accomplished on the Hudson, proving that we are not entirely destitute in this department of ornamental gardening.

THE FLOWER GARDEN.

The ROSE claims our attention as the most desirable object for the embellishment of the flower garden and pleasure ground; there is such a variety in color, and diversity in size, form and habit, that it can be adapted to almost every situation and position. The arbor is never so effectually clothed, as it is when a few select Prairie, Noisette and Bour-

bon Roses are judiciously twined upon it. The *Gloire de Rosamene*, *Queen of the Prairies* and *Solfaterre*, are well adapted to such a purpose. Many new varieties of yellow roses are described as much superior to the *Solfaterre*, but they require further trial.

Williams' Evergreen Climbing Rose has been highly recommended by several writers and florists, but men of judgment assure us that it is not equal to the reports circulated concerning it. Rivers represents it as of a dirty white color, with flimsy petals. Rival florists are not, however, in all cases, worthy of full confidence, and we well remember the opinion given by this gentleman of a new yellow rose raised nearer home; he is, however, one of the most reliable of English rose growers.

The multitude of new varieties of this popular flower, (or at least varieties with new names,) which are annually sent abroad by the French florists, keep rose fanciers continually on the alert, and afford material for the exercise of their powers of discrimination. Thomas Rivers is after them, in his peculiar quaint style, and sums up their achievements effectually, in a late article on the Rose. Out of about four hundred and eighty-six roses, which have been sent out by the firm of M. Vibert & Robert, only twenty-seven are considered by Thos. Rivers worthy of recommendation: and out of about one hundred and eighty new roses sent out within the past three years, he calculates that thirty-one are worthy of cultivation. If such is a fair report of the novelties in roses, we may with prudence advise our lovers of novelties to be a little careful in importing, and a full test is necessary before placing them on our select list.

The subject of the cultivation and general management of the Rose is perhaps better understood by our lady amateurs, than any other branch of rural art. The facility for obtaining reliable practical information, which the publication of *The Rose Manual*, by R. Buist, afforded, was mainly the cause of this taste for rose culture. This little work has passed through several editions, and is still in demand. Other branches of gardening would be much more attended to, if reliable works, suited to the circumstances and wants of our people, were within their reach.

The condemnation of budded roses has been very general among a class of amateur rose fanciers, a few of whom are known to us. We cannot fully understand whether their objections are founded on their own experience, or on the reports of their friends. Roses on their own roots are, with these, the great desiderata. If we may be allowed to speak from what we have actually seen, we can state that Hybrid Perpetual Roses, budded on the true Mannetti stock, have bloomed more profusely and produced more luxuriant growth, under proper treatment, than the same varieties on their own roots. For careless cultivators, however, we concur in the general cry for roses on their own roots.

Limited space prevents us from offering any remarks on the method of cultivation, soil, propagation, &c., of this favorite flower. We are

obliged to confine ourselves to the enumeration of a few of the less familiar varieties.

Several novelties have been received by our florists, which are worthy of notice. The following HYBRID PERPETUALS are represented as superior: personally, we cannot say whether they merit the high encomiums passed upon them. Another season will test them more fully.

Bacchus—A seedling from the Giant of the Battle, is similar in habit to that favorite rose, but of a brighter color.

Lord Raglan—Scarlet crimson centre, outer petals dark purple, large and double.

Emperor Napoleon—Brilliant crimson.

Prince de la Moskowa—Dark velvet crimson, shaded with deep scarlet.

Victor Trouillard—Dark crimson.

Triomphe de l'Exposition—Bright, reddish crimson.

William Griffith—Rosy lilac.

MOSS PERPETUAL. — Several additions have been made to the list of Perpetual Moss Roses, of which we may mention *Saict*, as one of the most promising. Its color is bright rose, and is very double; it is a free bloomer, and said to be almost equal to the old Provence Moss in this respect.

Madame Ory is also highly spoken of as a late bloomer, of a bright carmine color, and good form.

Alfred de Dalmas is another of the new Moss Roses which are represented as worthy of recommendation; the flower has the centre of a rose color, with the outer petals rosy white.

There are many new Mosses which cannot be classed as Perpetual, said to be superior to those already known. In addition to the *Countess of Murinais*, now pretty well tested in this country, there are the *Glory of the Mosses* and *Wm. Lobb*, recommended as worthy of trial.

TEA.—The *Glory of Dijon* is one of the new Tea Roses. It is of a yellow shade, tinged with carmine; very large and double.

Souvenir de David is a bright cherry red, good size, and double.

Souvenir d'Elise is sent out with a very high character. Its color is yellow, with a carmine tint at the bottom of the petals; of very fine form and large size.

BOURBON. — In this class of Roses many choice and new varieties may be noted. We can recommend

Comte de Montijo—Purple, shaded with bright scarlet.

Mirror of Perfection—Rosy violet.

Reveil—Carmine, shaded with violet.

Louis Odier—Fine rose color; well formed.

Charles Martel—Violet crimson.

Prince Albert—Bright carmine.

BENGAL, OR CHINA. — This is a favorite class of Roses with many, on account of their constant blooming, when properly managed. In addition to those recommended last year, we may mention,

Arch Duke Charles—Rose, changing to crimson.

Duchess of Kent—Rosy white.

Eugene Hardy—White, slightly flesh colored.

Viridiflora, the Green Rose, belongs to this class. This, though curious, is not at all beautiful, and is not calculated to maintain a place among choice roses. It is not by any means new, though a novelty to some; it is nothing more than a sport, in which the petals, generally colored, have assumed the appearance of bracts.

NOISETTE.—*Caroline Marniesse* is one of the prettiest of the Noisettes. It is an abundant bloomer, with well formed, button shaped flowers, of a white color, slightly tinted with rose.

Jeanne d'Arc is larger than the preceding, of a similar color.

Viscomtesse d'Avesne is a well formed flower, rose colored.

Euphrosine—Rose and yellow; fragrant.

Beauty of Green Mount is a Noisette raised by a Baltimore florist, and highly recommended. Color brilliant carmine; large and double. It is said to be quite hardy.

Woodland Margaret is from the same source as the preceding. It is a white, said to be very large and double, with the fragrance of a lilac; also a free blooming variety. If these two American seedling roses maintain the high reputation claimed for them, they will be decided acquisitions. They must undergo a fair trial.

THE DAHLIA.

As a first rate bedding plant, the Dahlia can never be considered as desirable for American gardens. Our summers are occasionally very dry, by which the due development of the plant is retarded; and again our early frosts blight the flowers when in their meridian splendor. The night before a frost in October, and the next morning, present a disheartening contrast to the Dahlia grower. Occasionally a fine display is made at our horticultural exhibitions, when the weather happily favors the occasion. Many large collections of this variable flower are to be found in the country, and additions are annually made of European novelties. For the benefit of those not conversant with the popular varieties, we may insert the names of a few select sorts.

Gem of the Grove—Dark maroon.
Beauty of the Grove—Salmon, with buff tip.
Mr. Selden—Rosy purple.
Grand Duke—Lilac; very large flower.
Ringleader—Bright red.
Shylock—Scarlet.
Sir John Franklin—Buff; small flower.
Unanimity—Scarlet.
Baron Alderson—Orange, with white tip; very large.
Mr. Francis—Red.
Gen. Faucher—Fawn color.
Seraph—Orange; a free bloomer.
Feu Brilliant—Orange scarlet.
The Nigger—Very dark, nearly black; fine form.

All who attempt the cultivation of this flower, must attend to the taking up and housing the roots in winter, and subdividing them in the spring before planting. We have heard persons complain of their

Dahlias not blooming, who never divided the tubers, but planted them entire. A dozen stems are thus produced, all weak, instead of two or three strong ones, and the probability is that not a single well formed flower will be obtained.

THE VERBENA.

The Verbena is an indispensable bedding plant. The facility with which it is increased and propagated, has made it a general favorite with our amateurs, whose means do not permit them to indulge in expensive styles of gardening. The Verbena is always pleasing; when in a luxuriant condition, its trusses of bright flowers are very showy, and when the soil is suitable, with a little care in the early part of summer, until the plants become established, a very attractive flower-bed may be secured by a judicious selection of varieties.

The Verbena may be propagated by cuttings of the young wood, or, in the latte part of the season, by the rooted branches, which may be establishe in pots for wintering in the green-house. Early in the spring, when these begin to grow, the cuttings may be taken off to provide bedding plants for the summer. Sandy loam is the most suitable soil for the Verbena, which may be enriched by the addition of a little well rotted leaf mold or compost.

As the Verbena will not withstand frost, those who have no facilities for housing them during the winter season must submit to the painful necessity of seeing their beautiful favorites perish at the approach of winter. Fortunately, the price of a few young plants is not so great, as to warrant the owner of a small city lot in the attempt to preserve them over the winter. The plants must not be planted out till the frost has entirely disappeared in the spring, and the winds have lost their chilling influence. The following are desirable sorts:

Defiance (Robinson's)--Rich scarlet.
Orb of Day—Crimson scarlet.
Chauvierii—Dark crimson scarlet.
General Scott—Dark red, with large trusses of flowers.
Peter B. Mead—Clear pink, shaded, large flower.
St. Marguerite—Rosy crimson.
Wonderful—Large; light color.
Mad. Lemounier—A choice striped variety.
Imperatrice Elizabeth—Lately introduced; very desirable.
Heroine—Light blue, dark centre.

The variety of Verbenas is endless, and as they ripen their seed freely in this climate, many seedlings are annually raised. It is frequently very embarrassing to be called upon to give an opinion as to the merits of a seedling much inferior to many in cultivation, yet believed by its hopeful cultivator to be "a decided improvement upon anything he has seen of its class." Firmness in such cases is indispensable, for there are already too many trashy seedlings.

THE PETUNIA.

A bed of good seedling Petunias is, in our opinion, as desirable as a collection of miserable, stunted plants, raised from cuttings of choice

named sorts, such as we often see planted out. If a few really desirable showy varieties can be propagated, and vigorous plants obtained, we should prefer them, yet after all, they are scarcely worth the extra care. Well saved seed will produce many choice seedlings. The following are select varieties:

Prince of Wales — Rich crimson purple; flower large and fine.

Yorkville Beauty — Carmine, with light throat.

Harmonia—A very curious spotted variety, flowers large.

Crimson King—Rich velvet crimson.

The annexed cut represents a variety called *punctata*, the first of that particular style introduced.

A variety with green margin, called *Baron de Rohan*, is very much admired by some. It is a continental variety, and looks well on paper.

The Petunia ripens its seed abundantly, and is easily raised by sowing in sandy loam, either in pans or on the well prepared border. There is a great tendency to the production of white varieties, and in saving seed such should always be rejected.

HARDY BORDER PLANTS.

The PHLOX is one of the most useful and desirable of this class of plants. No extra care or attention is required in its treatment, and the great diversity of color and habit give it a claim on the lovers of variety. The list of choice Phloxes has been greatly increased during the past few years. There are two sections — the *decussata*, or tall growing, and the *suffruticosa*, or dwarf sorts.

DIELYTRA SPECTABILIS, introduced about ten years ago from Japan, is esteemed as one of the greatest acquisitions to our hardy border plants. Very few persons of taste have neglected to add it to their collections. Its flowers, of a very peculiar form — color, bright, rosy pink — are produced in graceful pendulous spikes. It is also well adapted for forcing.

CHRYSANTHEMUMS. — The scarcity of autumn flowers in the garden has led to the careful cultivation and multiplication of varieties of the Chrysanthemum, of which there are now several hundred varieties. There are two distinct classes: the *Pompone* or daisy, and large flowered sorts. The Pompones are much cultivated in pots, and the great diversity of color and form renders them desirable for the decoration of the conservatory. The large flowering kinds form attractive out-door plants, as they bloom freely when planted in a sheltered locality.

Several perennial varieties of LARKSPUR are showy border plants: color rich blue with large spikes of flowers. *Delphinum Barlowi* is one of the best.

PANSIES, PRIMULAS, DAISIES, HOLLYHOCKS, and several other families of border flowers, should be noticed here, but our notes have far exceeded the limits assigned them.

We feel much reluctance in overlooking several families of choice BEDDING PLANTS, such as CUPHEA, LANTANA, SALVIA, HELIOTROPE, and GERANIUM, of all of which there is a great variety.

The FUCHSIA we must not entirely pass over. A new feature has been introduced in the production of Fuchsias with white corollas, which are decidedly beautiful. Of these, *Mrs. Story Queen Victoria*, and *Prince Albert*, have been already extensively distributed by several of our florists, and are really pleasing novelties.

BULBOUS ROOTS we have not introduced, as to do this branch of the subject justice would demand several pages. When spring begins to open, what is more pleasing than the chaste SNOW DROP and graceful NARCISSUS, followed by the brilliant CROCUS, the gaudy TUMP and fragrant HYACINTH? These alone are sufficient to form a rich and varied flower garden: but Nature, which at all times and in all diversity of forms, charms us with her new creations and dazzling colors, soon replaces these by a succession of more permanent flowers. Spring clothes the shrubbery and the forest with fresh foliage and fragrant blossoms, to be succeded by ROSES following in the train of summer. The LILY, pure and chaste, or rich and glowing, gives way to the GLADIOLUS and TUBEROSE; and in all the diversity of color and form, we cannot fail to trace the cunning hand of man, aiding to add variety to the creations of the Deity, and modifying, to suit his own fancy, the original tints bestowed by the pencil of the great artist, Nature.

Let all who would magnify the Deity learn to appreciate the forms of vegetable life, and love the plants, and trees, and flowers, as the tender and gracious gifts of a bountiful Providence.

KEEP your seeds, bulbs, tubers, &c., in a place where neither heat, frost nor damp can reach them; for either of these would destroy many

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SEEDS of the *Cucurbitaceæ*, as Melons, Squashes, Cucumbers, &c., if kept several years, will produce more fruit than new seed, for the reason that they run less to vine.

HINTS ON POULTRY, MANAGEMENT, &c.

WRITTEN FOR THE RURAL ANNUAL AND HORTICULTURAL DIRECTORY, BY C. N. BEMENT, AUTHOR OF THE "AMERICAN POULTERER'S COMPANION."

It will no doubt appear novel and strange to some, in this advancing age, that any one should attempt or presume to enlighten the farmers on a subject which created such a furor in this country a few years since. The excitement has had the effect of calling attention to the subject of the improvement of the various breeds of poultry, and we have no doubt much good will come out of it. If poultry has ceased to be a "mania," it still remains a subject of considerable interest to many; for there are few persons who do not relish a *fresh laid egg*, an *omelet*, or a fine *fat pullet*, when broiled or fricazeed, and served at table; and these are some of the comforts, not to say luxuries, which happily, in this country, can be had in as great perfection in the humble cottage of the poor, as in the luxurious mansion of the rich.

It is affirmed that with the exception of prime cows, there is not on the farm a single article of produce, animal or vegetable, that according to the value of the original investment, and the expense and labor of production, yields as much clear profit as will come from the poultry-yard if properly attended to. This assertion is made with confidence, because it is sustained by our own experience, and by a careful examination of the subject. What better occupation, or rather what better recreation and amusement can the younger members of a family have, than to feed and watch over the poultry of a farm? In this way they may clothe themselves, and pay for their books, without interfering with the school exercises or any reasonable labors expected from them in other things.

We are not going to write a history and description of all the different breeds of fowls, for that has been done over and over again; but we will endeavor to show that though poultry form a very insignificant part of the live stock of a farm, yet they ought not to be altogether discarded. On the largest farms, a few domestic fowls pick up the grains which might escape the pigs and be lost; and on small farms, the breeding and rearing early chickens and ducks are found profitable. The profits arising from well managed poultry are as important to the practical farmer, as any other branch of live stock, in proportion to the cost and attention bestowed.

Chapters and dissertations enough to swell into folio volumes, have been written upon the usefulness of rearing poultry of all kinds, and have failed to exhaust the subject. Able pens have been placed in requisition, to prove that a national benefit should and must accrue from this home and home-improving mode of producing an increase of provisions. The different methods in which poultry-keeping may benefit us, are almost as numerous as the varieties which we possess, and among them the creation of an innocent amusement is deserving a prominent position. And we see no reason why poultry should not be

considered a species of agricultural stock, and turned to good account both for producers and consumers.

The rearing and keeping of poultry is becoming an important branch of rural economy; but many farmers consider fowls rather a nuisance, and that they "cost more than they come to." Some too, poor souls, even dislike the little trouble it may create, and viewing it as an insignificant item, are apt to say when asked for their opinion—"I believe it pays, but cannot say for certain," and are content to jog on as before. Nevertheless, it is important to know that the product of fowls in the aggregate must be very considerable, and no one can entertain a doubt that the amount of capital invested in this country, in this apparently inconsiderable branch of domestic industry, is very great; still the demand for poultry and eggs is increasing, and will continue to increase, with the increase of the population in our cities and villages.

Whatever may be the result of the "poultry mania," it is unquestionable that the demand will continue. Immense numbers of fowls are being disposed of daily, and although the supply may be greatly increased, it is unequal to the demand. It was said years ago, when canals and railroads were completed, horses and oats would be unsaleable. Every one knows that has not been the case, for horses and oats were never higher than at present; and it will be the same with fowls.

Poultry, except to the wealthy, has always been considered a luxury; it may still continue so during a few months in the year; but there is no good reason why, in the autumn and winter months, it should not be within reach of those whose means are small. It can be raised at little expense, and sold at a reasonable price. Wherever it is offered purchasers will be found, and create a market where none before existed. The consumption of fowls in fact is already large, and but for their unnecessary costliness, would be larger still. For this unnatural price, there is no kind of excuse. The means of transport provided by railways so completely answers all purposes, that every county of New York, as well as several counties of adjacent States, may either transmit its produce to the city of New York, or select its own market elsewhere, at a very small cost of time or money. Fowls, too, travel more easily than any other animals. They can be despatched either dead or alive with equal facility. Yet, although fifty cents the pair for chickens would, according to all calculable expenses, be a remunerating charge, the citizens of New York are compelled to pay at least double that amount.

Early spring chickens, taken to market in the month of July, will probably command a better price, according to the cost of production, than at any other age. And this indicates at once the main point towards which the improvements of our Poultry Societies should be directed—the combination, as nearly as may be, in one bird, of early maturity, hardihood of constitution, and excellence no less than quantity of meat.

Happy for the poor and ignorant, poultry is just the kind of stock

which any of them can buy, and feed, and rear, however humble their mental capacity and pecuniary means may be. The young, the feeble, the halt, and the invalid, can look after the poultry as well as the strongest; and some of the most successful in this branch of business, have been those whose physical disabilities have prevented their employment in more important avocations. How many homes, too, have been rendered more attractive by the addition of a poultry-yard, on account of the interesting occupation which it creates, unconnected with produce and profit.

There is another important matter connected with this subject of poultry, not to be estimated in dollars and cents, but of far more consequence than either. It is the social and moral influence they exert, especially on the junior members of our families. The flower and vegetable gardens, ornamental lawns and useful fields, are all attractive, with their varied broducts of beauty and utility; yet they fail to enlist that sympathy and feeling which attractive animal life affords. How very much more of interest the pet horse, or cow, or lamb, excites among the little ones, or even among the serious, than the choicest among the trees, or shrubs, or flowers. And as we descend in the scale of size, to certain limits, we intensify the interest of our children in the domestic pets. The tenants of our poultry-yards, with their youngling broods, are, of all other things, what earliest catch and rivet their attention, and determine their devotion to rural life. By thus withdrawing their thoughts from frivolous games vicious sports and indulgences, or idle, worthless habits, a great point is gained toward developing and maturing the future useful member of society Fowls are preferable to the usual pets—dogs, cats, parrots, and singing birds; there is less danger, too, of disease from them, much more variety, more scope for ingenuity in rearing and attending, and we will not add on which side the profit is likely to be. If for no other reason, then, than to interest the children in a useful, attractive pursuit, we would say to any person who has the room, by all means keep poultry.

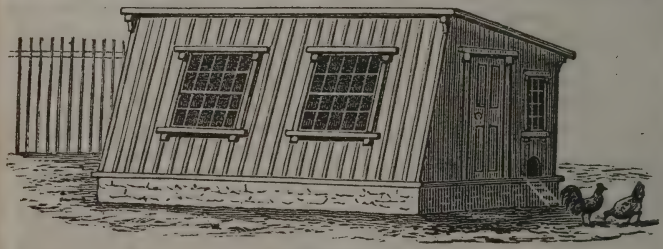
ACCOMODATIONS.

It remains now for us to mention a few points requisite for the successful keeping of poultry. Whether fowls are suffered to run at large or are confined, there should always be suitable accommodations, where they can lay, batch, roost, and be fed. Most farmers pay little or no attention to their fowls, suffering them to roam and run about when and where they please; to lay and hatch where it suits them best, and to roost on trees, under sheds, on the wagon, cart, hay-rigging, &c.,—soiling by their droppings, plows, harrows, or whatever may chance to be within reach. This should not be so. Fowls, it is true, may be kept anywhere. We have heard of first-rate broods being raised in a garret, and they never knew there was any other world beyond a small back yard in the street of a village. However, such success could only be achieved by constant attention, and good judg-

ment in supplying artificially the wants of the birds, which the place of confinement did not afford.

Many persons commence house-keeping by procuring a wife, and then a house; but as this system has its inconveniences, we recommend to begin with the house. "First procure the cage, then the bird." Previous to getting a stock of poultry, provide for them a house. If it is desired to confine fowls to a yard for all or a portion of the time, it will be indispensable to their health and productiveness, to provide for them suitable accommodations. These need not be expensive, but the fixtures should be efficient and complete, so as to secure the safety of the fowls. The houses and yards, therefore, must be constructed according to the purposes of the proprietor. He who keeps a cock and four or five hens, merely for his own supply, will require a very simple arrangement; but the proprietor who breeds for sale and profit, must have a more elaborate arrangement.

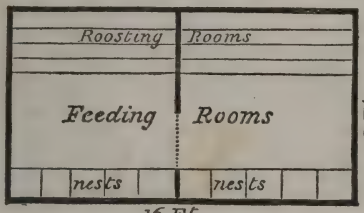
Having settled all preliminaries, we propose now to give the elevation and ground plans of a very pretty and cheap model of a poultry-house, which can be made to accommodate from twenty to five hundred fowls.



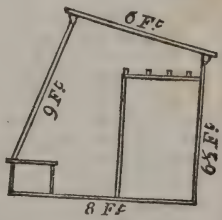
Poultry House.

The posts in front should be twelve feet high; the back posts four feet shorter. This will give a good pitch to the roof, and shed rain readily. It may be of shingles, of boards battened, or what is still better, both for warmth and coolness, thatched with straw. The sides and ends covered with boards running up and down, and the cracks covered with battens; but the better plan is to use inch and a quarter spruce plank, tongued and grooved, which will secure more warmth. It will be observed that the top of the front wall inclines backward. This is for the purpose of imparting greater heat, by obtaining more power from the rays of the sun in winter. In the end is a door for the keeper, and a small one for the ingress and egress of the fowls. This door should be three feet from the ground, with steps outside and inside for the fowls to pass up and down. If there is danger of the skunk or fox, remove the outside ladder and make a platform for the fowls to alight on. There should be a small window with slat blinds, in each end, for ventillation. The internal arrangement is so clearly

exhibited in the annexed plans, that a description or explanation is unnecessary.



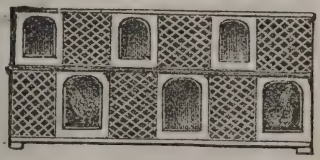
Ground Plan.



Sectional Plan.

NESTS. — It is not essential to success that the nests should be on the ground, though we always so construct some of them for the use of our own hens, in conformity with the general observation, that hens when left to their own choice usually do so. But whether on the ground or raised somewhat above it, they should be warm, and partially secluded.

The style and form of the nest boxes must be determined by the size and kind of fowls for which they are designed. If for large Asiatic fowls, the boxes must be made low and easy of access, so that the hens will not be obliged to fly up to get in. The boxes also should be shallow, so that the hens need not hop down from the rim, as in that case they are liable to break the eggs. Sometimes nests are fixtures built against the wall, not unlike pigeon-holes on a large scale, resembling somewhat the annexed figure. The first or lower tier should be about six inches from the ground, and each apartment should be eighteen inches square and two feet high, suitable for the large sized varieties of fowls. The next or second tier may be twelve by thirteen inches, and eighteen inches high. This tier, being six inches narrower, may be set back six inches on the lower one, by which a ledge is formed for the hens to reach the nests. If more tiers are added, narrow shelves may be placed in front of each box, with a ladder of ascent for each tier. This form of nests will admit of being extended to any length or number of tiers required; the top sloping at an angle of forty-five degrees, to prevent the fowls roosting on it.



Nests.

The hen likes privacy, and if left to follow her natural instincts, will seek some shrubby thicket, tuft of grass or rank weeds, if out doors, or in the manger of a shed, — in short, almost anywhere, if she can

escape the gaze of man or animals. To humor this propensity, we propose to lattice the front of the nests, as seen in the engraving above, or place bows of evergreens in front of the boxes, which not only give them *apparent* secresy, but admit air, so desirable in hot weather.

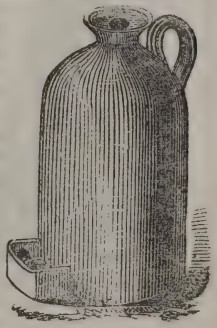
Why we give preference to latticed fronts, to close boxes, is by reason of the constant circulation of air going on through the interstices. This has much more to do with the comfort of the hens, and the perspective of "counting the chickens before they are hatched," than many people are aware of. In nine cases out of ten, laying and setting-boxes are too *hot*, *close*, and *dry*. Draw a comparison, if you please, between them and a stolen, or if you will, more natural nest in the open air;—which of the two are notorious for producing a numerous and healthy offspring?

Feeding Hoppers.—Under certain circumstances, feeding hoppers, or other contrivances for the same purpose, may be desirable. We have found by experience, that it is more economical to keep feed constantly within reach, where fowls can help themselves at all times, and for that purpose we constructed several kinds of feeding-hoppers, one of which is represented in the annexed sketch, which may be placed either in the house or yard. To avoid the annoyance and depredations of rats and mice, which would drive away the fowls and rob them of a great portion of their grain, we place it on a post, in such a manner as to protect it from their encroachments. Any man or boy who can handle a saw, a jack-plane, and a hammer, with a few nails could make one in a very short space of time, and the cost would be little or nothing. The fowls will soon learn to leap upon the platform, and pick the grain from the box between the slats. Some saving in grain may doubtless be thus effected, especially in wet weather, when the birds are not fed under cover. Although fowls always appear to devour with more zest and satisfaction, that which is thrown to them on the ground, it is, to say the least, a wasteful and slovenly practice.

The Stool Hopper.

Water Fountains.—Impure water may be set down as a main cause of the diseases of poultry, especially with young birds. To the drain-

age of the manure heap, stagnant pools, &c., we may look for catarrh, gapes, roup, diarrhœa, and a great number of other maladies. If a supply of running water cannot be had in the yard, water fountains may be introduced. The one represented in the annexed figure will be found useful, where only a few fowls are kept. It is a self-feeding fountain; simply a stone vessel, with a small hole near the bottom, thro' which the water feeds into a dish in front, as the fowls drink. The small hole at the bottom is just below the edge of the dish. After filling with water, the vessel should be corked perfectly tight; then by removing the plug at the bottom the water will flow until the basin is full, and will remain so till the fountain is exhausted.



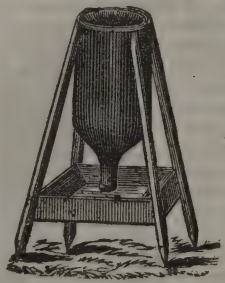
Water Fouutain—No. 1.

Where a large stock of fowls are kept, a demijohn or carboy, (or where these cannot be obtained, a stone jug, as shown in the annexed engraving,) set in a frame, with a shallow earthen or iron vessel underneath, has been found to answer a good purpose. Kegs or barrels may also be used in the same way, by suspending them in a frame, and attaching a tube to feed the trough. Glass vessels, however, have the advantage over wood, of showing when the water is exhausted, and can be kept clean and sweet with very little trouble.—These, of course, should not be left out in the yard in frosty weather, but should be removed to where the atmosphere is above freezing.

Water Fountain—No. 2.

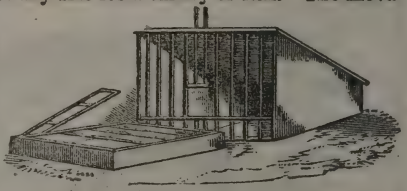
In the 12th Vol. of the Genesee Farmer, we find a very simple water fountain, constructed on the same principle. An ordinary junct bottle forms a reservoir; the trough below is made by scooping out a

thick piece of plank, forming a shallow trough, and making a support by nailing pointed lath to the corners of the trough, as seen in the figure, and inserting the bottle, when filled, between the lath, which clasp it; the nozzle of the bottle resting on three or four nails driven into the trough sufficient to raise the mouth half or three-fourths of an inch from the bottom, which will allow that depth of water to remain constantly for the chicks. In this way, a regular supply of pure water is kept, and the chicks will not wet their down or feathers, nor soil the water by running in it. When the hen is confined in a coop with her little family of chickens, they require considerable water; and if a vessel is deep the chickens are sure to get into it, and not only soil and contaminate it, but often get their down wet, which injures, chills, and frequently kills them.

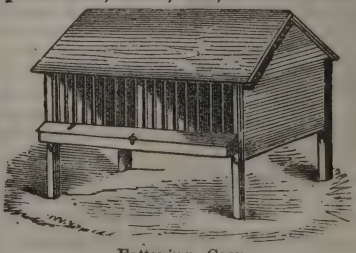


Water Fountain—No. 3.

NURSING COOP. — Annexed is a figure of a most convenient nursing coop, which may be made of any size for a turkey or hen. The movable bars show the place where the mother hen is made to enter; the chicks can run in and out through the space at the bottom, and can thus be either allowed complete liberty to range within call of the mother, or can be inclosed within the movable little yard in front, which also has movable bars, as shown in the figure, to place food, water, &c., within their reach. This appendage will be found very useful for the first week or two, for turkey chicks, for ducklings, or any other chicks which it may be considered scarcely safe to indulge with an unrestrained range.



Nursing Coop



Fattening Coop.

FATTENING COOP. — An excellent fattening-coop for fowls is shown in the figure annexed. During summer, it may stand in a shady spot in the open air, and in the cold months may be lifted into the shelter of an out-house or stable. It is six feet long, six feet high to the edge of the roof, and two feet eight inches wide, with a partition in the middle, so as to di-

vide the fowls, and receive a succession of birds. The feeding-trough in front has a lid on the top, to receive the food without disturbing the trough. The trough should be made of tin, and a small portion partitioned off for water, which should be changed, and the trough cleaned daily.

YARD.—Where it is intended to keep a large number of fowls, let the yard be of ample dimensions, which of course must be regulated by the number intended to be kept. Those contracted seven by nine pens which meet our eyes throughout the country, are not calculated to answer the purpose for which they were intended. Half an acre, at least, for every hundred fowls, (and more than that number should never be kept in one flock,) is little space enough for them to roam in; and in order to unite all the advantages desirable in a poultry-yard, it is indispensable that it neither be too cold during winter, nor too hot during summer; and it must be rendered so attractive to the hens, as to prevent their laying in any chance place away from it. To shield them from the chilling blasts of winter, and the scorching rays of the sun in summer, we would recommend planting evergreens on the borders of the yard, and shade trees in the centre. This, with a good covering of grass, would leave little to be desired on that part. And if the fowls can have access to a grass field occasionally, and the soil *dry*, then so far as the ground and situation are concerned, nothing to be wished for remains.

A picket fence, from six to seven feet high, will be sufficient to prevent the fowls from flying over; in fact, one half the height will answer for the large Asiatic varieties.

FOWLS.

Poultry-keepers may be divided into two parts;—those who keep fowls for fancy, and those who keep for profit. At the present time, we have only to do with the second; and the question naturally arises, "which is the *best* and most profitable breed to keep?" This is a question more easily asked than answered. Our answer, however, would be "that which produces the greatest number of eggs, and that which is the most thrifty and feeds best at an early age, at the least expense, and possesses those properties most valuable for food."

As to the question which variety of the Asiatic race would be best adapted for such purposes, our belief is that the Cochin will stand second to none in this respect. A writer well known in poultry annals says: "In spite of their present high price, in spite of the prejudice which at present exists against them as fowls for the table, and the quantity of corn they are accused of consuming, I do most assuredly believe the Cochin-China fowl to be the best for the poor man and the farmer, considering them, as I once before had occasion to remark, not as *fancy* but as *productive* stock."

Looking at the "chicken" merely as a machine for the conversion of cheap materials into a costly article of animal food, the point to be considered by those who have this object in view, and would be guided

by motives of economy in their selection, is not which machine will consume *least* of the raw material, but which will manufacture the article most expeditiously, and give the quickest and greatest return of serviceable food; and here, we think, it will not be questioned that the Cochin and the Dorking possess these qualities in a pre-eminent degree.

The Black Poland fowl is esteemed one of the most ornamental and useful, as the hens are always industriously occupied in *producing*, under one form or another. They are among the most *prolific* layers, and their flesh is particularly fine and delicious. By warmth and judicious feeding, a hen may be made to lay as many eggs in two years, as she would under ordinary treatment in three; and every body knows that a fowl fattened at two years old is much more tender and palatable than one that is older The shape of the Polish fowl is good, being plump, square, full breasted and short legged. They bear the restraints of a yard well, laying abundantly, of large-sized eggs, and are slow to sit; indeed, mostly "everlasting layers," but less invariably so than some other breeds. Sonnini tells us that in Egypt they are in great request for the table, and our own experience confirms the preference.

Polish Top-Knot Cock and Hen.

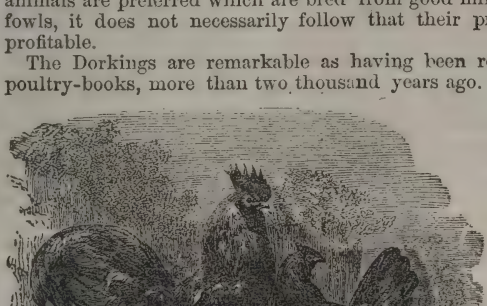
The Spanish Fowl, the heads of which are to be seen in the annexed cut, is of medium size, and the hens are notorious as abundant layers, and their eggs are very large and very white, very thick at both ends, yet tapering off a little at each, and weigh from one and a half to three ounces each. Their flesh is delicately white, tender and juicy.

Heads of Spanish Fowls.

Like the Black Poland, the plumage of the Spanish fowls is expected to be entirely of that glossy, sable color, ex-

cept glancing greenish tints on some feathers. This, with its quality of being one of the *everlasting layers*, makes it a favorite, where eggs only are wanted. Some persons complain that the hens are far better layers than sitters. Their peculiar,disinclination to sit, is regarded as their most valuable characteristic; for in our experience, we have been exceedingly annoyed by the constant propensity which some other hens have manifested in this respect. In the habits of the Spanish fowl there is nothing peculiar to require notice; they are not, it is true, so quiet and disinclined to roaming as the Asiatic varieties; but if well fed at home, they will not be found to stray far from their walk. Nor are they quarrelsome among themselves, to a degree at all troublesome. There is just as much necessity of breeding from fowls that are good layers, as there is in selecting milch cows; those animals are preferred which are bred from good milkers, though as in fowls, it does not necessarily follow that their progeny are equally profitable.

The Dorkings are remarkable as having been recorded in ancient poultry-books, more than two thousand years ago. In size they rank next to the Asiatic tribe. They are short-legged, large bodied, and readily accumulate flesh, which is of good quality. The breed was introduced from England, and has been bred in this country for a number of years. Mowbray, when he wrote, ranked them in size in the third degree of the largest of fowls. The weight of the Dorking at maturity varies from five to eight pounds, and full-grown capons have been known to weigh from ten to twelve.



Dorking Cock and Hen.

The original Dorkings are represented as being of an ivory-white, and as having uniformly five toes or claws on each foot. Among the early importations of pure blooded Dorkings into this country, white more or less prevailed; but in later importations the speckled and brown colored—a stronger, larger, and better constitution fowl—has been introduced. At the Monroe Co. (N. Y.) fair, held at Spencerport in 1855, we noticed a pen of six very superior chickens, one cock and five pullets, of the speckled Dorkings, which pleased us. They were

decidedly the best we had ever seen. In England, at the present time, they are great favorites, and bring the best prices there, both among the breeders and in the market. They are good though not great layers, capital mothers, and come early to maturity; but they seem to bear breeding "in-and-in" worse than any other variety. It is considered, therefore, desirable to change the cock every year, or every two years at most, if the stock is to be kept pure and in high vigor.

Dominique Cock

There is another breed or variety, to be found in almost every poultry-yard, whose merits we would particularly recommend, as they possess some traits not found in the Poland or Spanish. We allude to the Dominique fowl, represented in our engraving, which are good layers, good sitters, and good mothers. They are healthy, hardy in constitution, easy to keep, small bone, and plump in their make; flesh tender, juicy, and of delicate flavor; besides, they are of beautiful plumage, and in all respects a valuable fowl.

Game Cock and Hen.

For those who do not wish to give much attention to fowls, there is, according to our opinion, no breed equal to the Game. They are hardier, less liable to disease, keep fat with less feed, and raise more chicks with less care than any other kind. They are not so

great layers as some, but full equal to the average. They are an extremely valuable breed, both on account of their beautiful form and plumage, and their usefulness. They branch out into numerous varieties, of which the black-breasted reds and the duck-winged grays are considered as the best. Both their flesh and their eggs are of first rate quality for the table, though neither attain the bulk of some other breeds.

There are several varieties of the family of Hamburgh fowls; such as the silver and golden pencilled, silver and golden spangled, silver and golden pheasant, coral or creole, Bolton bays, Bolton grays, &c. They are called Creole, from the intermixture of the black and white; Coral, because the numerous points of the polished, bright scarlet rose-comb bear no distant resemblance to grains of red coral; Bolton grays, from their being extensively cultivated in and about Bolton, a town of that name in England. All Hamburgh fowls, though scarcely of medium size, are plump, compact, and beautifully marked, which, added to their great reputation as layers, should commend them as general favorites. Their eggs are of medium size; they are rather noted for long continued than rapid layers, and are rarely known to sit. They are active, neisy, and impatient of confinement; great foragers, tho' small consumers of grain;

Silver-Pencilled Hamburgh Cock and Hen.

Golden-Pencilled Hamburgh Cock and Hen.

and when full liberty and a good range are afforded, they are undoubtedly a most profitable fowl. Some consider them delicate in constitution, but this can be obviated, in a great measure, by a little extra care when young, which will be amply repaid in the increased size of the fowls when full grown. There has been a great deal said, by some, about this class of birds not being winter layers. When this is the case, there must be bad management somewhere. Hamburg pullets hatched in March or April, begin to lay in October, and will continue until moulting again, and it is surprising what a number of eggs are produced.

The Bantam is the smallest specimen of fowl, and may with propriety be called the Tom Thumb of the gallinaceous tribe, and stands comparatively, in size, to the Malay and Cochin fowl, as that of the noble and stately Durham to the diminutive Alderney cow. Though extremely small in size, the Bantam cock is elegantly formed, and remarkable for his grotesque figure, his courageous and passionate temper, his amusing pompousness of manner, his overweening assumption and arrogance; and his propensity to make fight, and force every rival to "turn tail," has caused him many difficulties.

White Bantam Cock and Hen.

The Bantam must be considered more as an object of curiosity than utility, and of course must expect to be received with no peculiar favor, in this country, except as a "pet." They arrive at maturity early, are faithful sitters, good mothers, and will lay more eggs, though small, than any other variety. They are very domestic, often making their nests in the kitchen, depositing their eggs in the cradle or cupboard of the dwelling when permitted.

Black Bantam Cock and Hen.

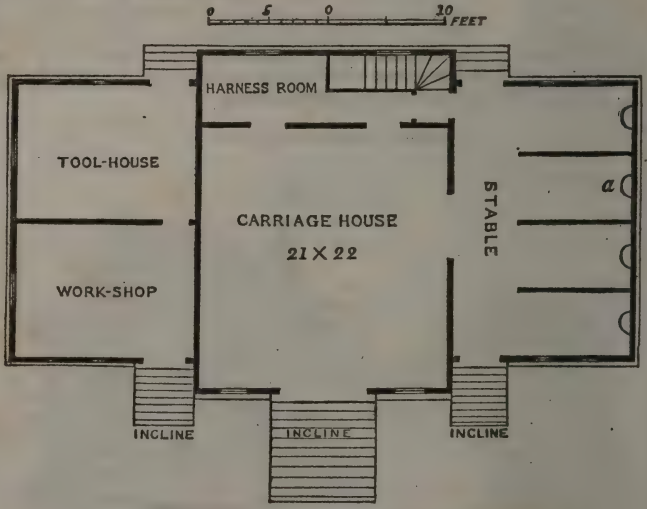
The Black Bantam is a most beautiful example of a great soul in a

little body. He is the most pugnacious of his tribe. He is more jealous, irrascible, and domineering, in proportion to his size, than the Game cock. He will drive to a respectful distance great dunghill cocks five times his own weight. He will even attack a turkey cock. He is, however, a pleasing little fellow, though an impudent, consequential creature. Oh, the little strutting, foppish scamp! Who would think that such a contemptible minikin as that should have the assurance to strut and parade his insignificant person in the presence of great hens, and should presume to show such marked attention to the members of families of weight and substance — before the Misses, and still more, the Mistresses Malay, Cochin, and Dorking? I declare to ****! Well, there is no knowing to what length impudence will go, so long as Bantams escape extermination.

CARRIAGE-HOUSE AND STABLE.

The above Carriage-House and Stable was designed by the late A. J. Downing; it is designed to produce a picturesque effect externally, and to contain internally all the convenience demanded in a building of this class. The central portion contains the carriage-house, with space

for four vehicles, and a harness-room at the end of it. On one side of this is the stable — the stalls 5½ feet wide, with racks supplied with hay through wells, over each rack, in the floor of the hay-loft above. A flight of stairs leads from the end of the stable to the hay-loft above, and is placed here, (and not in the carriage-house, as we frequently see it,) in order to prevent any dust from the hay-loft from finding its way into the carriage-house. On the other side of the carriage-house are a tool-house and a work-shop.



GROUND PLAN.

All the doors in this stable slide upon iron rollers running upon a piece of plain bar iron above the door. These iron rollers are attached firmly to the door by iron straps; and the door, being thus suspended, not only runs much more easily and freely than if the track were at the bottom, as is usually the case, but the track is not liable to get clogged by dust or other matters falling upon the floor. Besides this, a sliding door in a stable, when opened, gives the largest possible egress in a given space, and can never stand in the way to the injury of horses or carriages passing in or out on either side.

The high roof of this building gives a good deal of room in the hay-loft, and the ventilation on the top keeps this room cool and airy at all seasons. The whole is built of wood, the vertical boarding battened in the ordinary manner.

HEDGES.

WRITTEN FOR THE RURAL ANNUAL, BY H. E. HOOKER, ROCHESTER, N. Y.

The public feel great interest in the subject upon which we propose to offer a few remarks, and have shown themselves very desirous to have upon their own lands specimens similar to those beautiful hedges of England, of which travelers speak and dwellers in that country are justly proud. This interest has shown itself in many attempts, and almost as many failures, to have the celebrated live fences, until now the subject is in comparative chaos; and between objectors on the one hand, and real difficulties on the other, few men seem disposed to act intelligently and carefully in the matter.

Objectors arise and say: "We have no suitable plant; the Hawthorn of England will not answer — it is full of wooly aphis; the Privet is no defence against cattle; Buckthorn takes altogether too long to become a fence, being without thorns. Every thing we have tried is a failure; and even if we had a good plant, the hedge at best is not so good as a board fence, — nor while lumber can be had at a moderate price, is it so cheap. Besides, a *poor* hedge is a nuisance; it is neither useful nor ornamental; it does not protect your grounds; its open spaces at the bottom, and thin places where the plants grow feebly, are a continual torment to you; you cannot mend them with hammer and nails, nor cause the missing branches to grow. Your neighbors' pigs know what you have inside, for they can look through; and they know they can get there, for they have tried it many a time. You do not wish to build a fence where you supposed you were to have something better; but after teasing along six or seven years, you finally conclude to give it up and build a fence. Furthermore, we believe the cost of planting, pruning, and caring for the hedge, would make it more expensive than a good board fence." Thus, by mingling a few facts and considerable ignorance with a great deal of bitter experience, they make out apparently a pretty strong case.

In our treatment of this subject we shall give to these objections all the weight due them, but not allow a failure which is due to ignorance, or want of attention to correct principles, to prejudice our mind against a wise course, nor detract from the results of true theory well carried out; and if then the reader is able to see the truth, and make it of practical value, our end will be gained.

It is doubtless true that live fences, such as have been grown elsewhere, would contribute much to the *beauty* of our country, and if they can be secured at such an expense of time and labor, in planting, pruning and cultivation, as will bring them upon a level in this respect with our present unsightly fences, surely there can be no question as to the propriety of their general introduction.

Let us examine the first objection, which is "We have no suitable plant." This is a mistake. The Hawthorn of England *is* to be sure

objectionable, and cannot be relied upon, for various reasons; but the *Osage Orange* can now be said to have proved itself a very superior plant for such uses. It is hardy, as all experience shows, and the past two uncommonly severe winters have demonstrated. It is easily produced from seed. It is very vigorous and thorny — making a hedge which nothing can pass. It will bear pruning most admirably, and it has few or no enemies.

Here we have, combined in one plant, all the requisites of a good hedge plant; and if it is not a perfect one in the eyes of all men, it can hardly be maintained that there are any serious objections to it. We shall therefore not enter into any discussion of the comparative merits of this and other plants which have been proposed and tried with more or less success, but proceed to the description of the methods of raising a good hedge, and show some of the true principles of training — leaving it to the judgment of every cultivator to make such modifications in his practice as the peculiar nature of the plant dealt with may seem to require. We consider it of far more importance that true principles should be acted upon, rather than that any precise directions should be carried out; and if our readers who act upon correct theory, with diligence and perseverance, do not find live fences satisfactory, we must say let them be given up. But we do not fear such a result.

The first and great requisite of successful planting is, a rich, mellow and well drained border, free from the shade of overhanging trees. If there are large forest or fruit trees so near the site of the proposed hedge that their roots will extend through the hedge, or their branches overhang it, it immediately becomes a question which shall be sacrificed; it is impossible to secure both the hedge and the tree. The old maxim that "You cannot eat your cake and keep it too," never had a better illustration than in the attempts made by some persons to grow one tree upon the site already occupied by another, whose roots had possession of the soil, and its leaves and branches of the sunlight and showers. The few and partial exceptions to this great principle, (such as the fact that some evergreens will work along in the partial shade, and spread their roots among the roots of deciduous trees,) will not apply in the case of hedges, where the utmost vigor and all the conditions of health are required at the outset. Abundance of sunlight, therefore, must be secured its whole length.

Having cleared the site of the hedge of all obstructions, let the ground be graded so far as to remove all the abrupt inequalities, but be careful that the surface or fertile soil is not removed. The appearance of the hedge is injured by small hills and holes in the border, but without good soil you will never have a hedge which will give the least degree of satisfaction. In a majority of cases no draining will be required; but sometimes a hollow or hillside is springy: in such cases a tile or covered drain should be laid alongside of and parallel to the hedge, securing perfect drainage.

Where such a course is practicable, the original fence, if there be one, should be set six or eight feet outside of the line of the intended

hedge, and the border spaded or plowed up and made mellow for the width of eight feet — four feet on each side of the line. This will allow room for the passage of a horse and cultivator along the border for two years or more: with this instrument, the cost of cultivating the growing hedge will be very slight, and the culture very complete. A fine growth of the hedge cannot be secured with less width of border than this for three years time; besides, the space will be all required for convenience in pruning, manuring when necessary, and the spreading of the young plants. If the land is not rich, apply a dressing of stable manure to the whole border before planting, or in the fall following.

Planting should be done in April or May. Never in autumn, for the reason that the Osage Orange is a tap-rooted plant at one or two years growth, and will be very liable to be thrown out of the ground by the frost before spring. The plants used may be one year old or more, but yearlings answer every purpose. At this age they have simply a straight root, of perhaps one foot long; this should be shortened to about six inches, and the top cut off within three inches of the root. Thus prepared, the plants may be dibbled in along the line, at intervals of six or eight inches, in a single line — or double if preferred, for it is found that after a few years the spreading of the hedge is about equal in both cases. The single line is most readily cultivated, and therefore we adopt it altogether in our own planting. Let the border now be kept clean and mellow all the season, and few plants will die, and the year's growth will be about two to three feet.

In April following, cut the plants back to within one or two inches of the old wood. They will then sprout vigorously and grow strongly during the following summer: with good care the shoots should be six to eight feet in length. During the year the soil on both sides must be kept clean and mellow, and the width of the border not less than four feet on each side, and even a greater width is desirable.

The next spring, cut back the hedge to about one foot in height, allowing the *side* branches to remain. During the first summer month the growth of the hedge should be very rapid, and if it is so, it may be pruned about the first of July, giving the hedge a pyramidal form — not shortening the *sides* much, but cutting back the top severely. The tendency of growth being always very much to the top, care must be taken to keep the *width* and *density* of the bottom very great at first, as these requisites cannot be secured at any other time. The Osage Orange is not injured nor much impeded in its growth by this summer pruning, but after a few days resumes its growth, and breaking out at numerous buds, the hedge thickens up, and by the end of another month may receive a second pruning, or be allowed to go on until autumn or spring following.

The hedge has now become dense, and the proper form secured, but in the spring prunings which follow, care must be taken to keep the *top* down and gradually spread the sides: the top can be raised any year. Every summer, about the first of July, the coarse growth may

be cut back, and the hedge kept neatly in shape by pruning, if necessary, a second time.

If care has been taken to follow our directions, and to manure promptly any spots in the hedge which did not show equal vigor with the rest, no fear need be felt that the hedge will not be strong enough after four summers have passed over it. The further use of horse and cultivator will not be required, and if it has grown finely, will do better without further treatment of this kind: *growth* is not what we want now, as all the growth that is made has annually to be cut away by the shears of the gardener. The Osage Orange is a strong grower, and once well established will need no help to keep its vigor sufficiently for a profitable fence.

It is of the utmost importance that the right *form* should be given to the growing hedge, for if this be neglected serious evils if not entire failure are sure to follow. Every person in the least acquainted with the care and cultivation of plants knows how necessary are light and moisture to all parts of a tree, and we see immediately, where these are withheld, that the foliage perishes, and of course growth ceases in those parts. If, for instance, a hedge be so pruned that the upper part is allowed to overhang the lower — the lower being shaded and deprived of its due share of the falling rains, or obliged to use the drippings from above — it must there lose its foliage, and its healthy growth ceases, the small limbs die, and soon nothing but the bare trunks remain; all growth is at the top, increasing the evil, and shading more and more densely the bottom, until soon we have a specimen similar to the engraving which we give as a representation (rather flattering we think it on the whole, and better than most of our so-called hedges of these days,) of a hedge of bad form, and consequently failing to give satisfaction, because not trained upon correct principles.

Specimen of a Badly Trained Hedge.

The second cut is intended to represent a hedge properly treated, and in such form as gives to all parts access to light, air and moisture. If great height is desirable for any reason, it must be gradually attained,

and only permitted as fast as proportionate breadth and strength of the lower branches are secured.

Specimen of a Properly Trained Hedge.

When well grown and carefully pruned, there is nothing more decidedly ornamental than an Osage Orange hedge. The leaf is beautifully glossy and finely shaped, and we have yet to see the animal or the worm which wishes to devour it. So far as protection is concerned, it is far more fearful to man or beast, at six summers' growth, than a first rate board fence costing two dollars per rod; and it can be planted, the ground prepared under ordinary circumstances, and the whole care and pruning performed, according to the above directions, for four years, at one dollar per rod. If any man considers this too low an estimate, let him add one dollar per rod for the next two years — making two dollars per rod at six years' growth, and from that time forward he has a beautiful live fence, at the expense of a board one which must soon be renewed.

In conclusion we would remark, that we say amen to all the complaints of "poor" hedges. They are a nuisance, to the eye, to the pocket, and to any farmer's crops which happen to lie along the highway where such things have been depended upon for protection. But all this does not apply to *good hedges;* and the sooner we make up our minds to be thorough enough to secure a good hedge, the sooner we shall give over complaining about poor ones.

An Excellent Cement, for mending chinaware, may be made in the following way: Take a very thick solution of Gum Arabic, and add Plaster of Paris till it becomes a viscous paste. Apply to the edges of the article to be mended, and stick them together. In three days they will be as firm as ever.

A Cheap Varnish, for wood and iron work, and which needs no boiling, is made thus: One gallon of coal tar, half a pint of spirits of turpentine, two ounces of oil of vitriol, stirred and laid on like paint.

ENTRANCE LODGES AND COTTAGES.

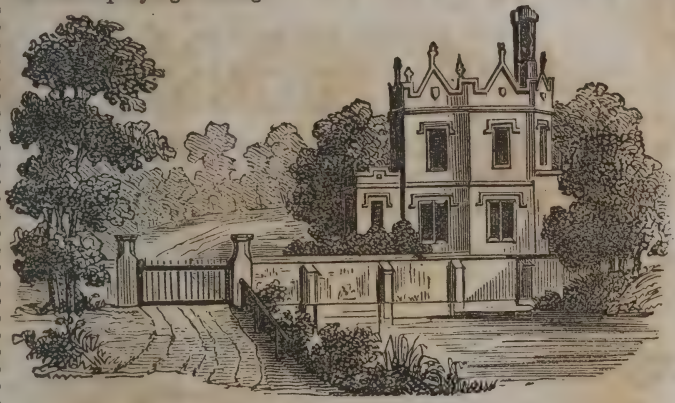
VARIOUS expedients have been suggested, to mark the entrance to a place with importance. A villa, with a few acres, must now be at some distance from the high road, in compliance with the modern custom of placing the house in the centre of the grounds. In such situations, the utility of an entrance-lodge, or cottage, is too evident to require discussing, but its character may be worth some consideration.

The entrance to a place is generally best marked at any branching off from a public road; and, where the boundary of a park is at some distance from the road, and the entrance a kind of private cross-road, a mere cottage may, perhaps, be sufficient, of any style of architecture, without reference to the style of the house, and a proper gate will distinguish it as an entrance to a place. But, where the gate immediately opens into a park, strongly marked, and bounded by a wall, or park-paling, a lodge seems more appropriate than a cottage; that it should partake of the style and character of the mansion, seems also to be required by the laws of *unity and design*, which good taste adopts in every art. If the architecture of the house be Gothic, the style of the lodge should be the same; as in the annexed sketch.

Modern Gothic Entrance Lodge, used as a School-House.

To mark the entrance to Cobham Hall, the seat of the Earl of Darnley, built in the reign of Queen Elizabeth, the style and character of the house, proposed to be adopted in the lodge, is not the modern Gothic style, with sharp-pointed windows, and a flat slate roof just rising over the battlements, but that which is distinguished by massive square-headed windows, with pinnacles, mouldings, gables, escuten-

eons, and the lofty enriched chimneys of former days, as shown in the accompanying drawing.



Park-Keeper's Lodge, Cobham, England.

To a modern cottage, or lodge, of Grecian architecture, the gate may either be a light wooden one, between two posts, or iron folding gates, with brick or stone piers, and it may be of any fanciful design. But, if the entrance to a place be marked by a respectable Gothic lodge, or a correct Gothic cottage, the gate itself, and even the gate-posts, should also be of the same correct style of architecture. We do not mean the flimsy light deal Gothic gate, frittered with little pointed arches, like a show-box, but the heavy strong oak gate, with massive hinges, and occasionally ornamented with *fleur-de-lys*, and iron spikes: it should appear to have been constructed at the same period in which the lodge itself is supposed to have been built.

Composts for Florist's Flowers.—*Carnations:* 1. Two-thirds fresh loam, one-third rotten dung, with a little sand. 2. One-half loam, one-half dung, with a little sand. *Ranunculus and Anemones:* Two-thirds loam, one-third rotten cow dung. *Dahlias and Narcissus:* Loam, well manured. *Hyacinths:* One-third sand, one-third loam, one-fourth rotten cow-dung, one-twelfth leaf mould. *Pinks:* Two-thirds loam, one-third two year old cow-dung. *Tulips:* Good fresh loam. *Auriculas:* One barrowful of loam, one do. leaf mould, one do. old frame dung, one do. two year old cow-dung, one peck sand. *Polyanthuses:* One barrowful sandy loam, one peck leaf mould, one peck old cow-dung. *Pansies:* Three barrowfuls fresh loam, one do. one year old horse-dung, one peck sand.

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THE

RURAL ANNUAL

AND

HORTICULTURAL DIRECTORY,

FOR THE YEAR 1858;

CONTAINING TREATISES ON

MANURES FOR THE ORCHARD AND GARDEN, GARDEN FURNITURE, PROFITABLE FRUIT CULTURE, BIRDS USEFUL AND INJURIOUS TO THE FARMER AND HORTICULTURIST, CULTIVATION OF GRAPES, RURAL ARCHITECTURE, ETC., ETC.

TOGETHER WITH LISTS OF

NURSERYMEN AND AGRICULTURAL IMPLEMENT MAKERS

IN THE UNITED STATES AND CANADA.

ILLUSTRATED WITH SEVENTY ENGRAVINGS.

ROCHESTER, N. Y.:
JOSEPH HARRIS,
(Office of the Genesee Farmer.)
1858.

PREFACE.

It is our aim to make each successive number of the Rural Annual and Horticultural Directory better than its predecessors. How far we have succeeded, must be left to the judgment of our readers. The present number has been prepared with much care. The articles have been written expressly for its pages, by men of experience. They are practical and reliable, and, we trust, will be found useful and interesting. The Lists of Nurserymen and Agricultural Implement Makers have been enlarged and corrected. The extent to which these Lists have been used, is evidence of their utility. An able article on the Cultivation of Fruit at the West, prepared for this number by an experienced horticulturist, has been crowded out. It will be given in the next volume.

C. E. FELTON, STEREOTYPER,
Rochester, N. Y.
A. STRONG & CO., PRINTERS.

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THE

RURAL ANNUAL

AND

HORTICULTURAL DIRECTORY.

MANURES FOR THE ORCHARD & GARDEN.

HEN our first parent was sent "forth from the Garden of Eden to till the ground from whence he was taken," he must have been agreeably surprised to find that, though the ground was cursed for his sake, and threw up thorns and thistles, yet the very means used to destroy them greatly increased the fertility of the soil. The spade, the hoe and the rake probably constituted ADAM'S whole stock in trade, and for many centuries the farmer was simply a "tiller of the ground." The antedeluvian agricultural papers had little to say of "Frauds in Artificial Manures." Guano was not then formed, and superphosphates, and poudrette, and cancerine, and fertilizing salts, were unknown terms. The earth, fresh from the hands of her Creator, needed only to be "tickled with a hoe, and she would laugh with a harvest." The term *manure*, which simply means *manual labor*, had then no other signification. To stir the soil and keep down the weeds were the only *manuring* processes known. In the course of time, however, it was discovered that the application of the droppings of animals had the same effect as plowing and hoeing in increasing the fertility of the soil, and the ROMANS thought so much of this great discovery as to give immortality to STERCUTIUS for the invention. This discovery was found to subserve a double purpose. The offensive and injurious gases of decaying animal and vegetable substances, when mixed with the soil, were not only rendered innoxious, but converted into milk and honey, oil and wine, and even into attar of roses, and the delicious fragrance of the orange and linden trees. No wonder that henceforward the management and application of manure held the first rank in all systems of agriculture and horticulture.

Any substance that will enrich the land, is generally considered a manure. In the present article, however, we shall treat only of those substances which increase the growth of plants by furnishing those elements of which plants are composed. Leaving out of the question iron, alumina and manganese, which are occasionally found in plants, it may be well to correct a very erroneous idea, that different plants contain different elements, by saying that *all* our commonly cultivated plants *are composed of precisely the same elements*. The only difference is, that these elements exist in different proportions, and in different forms of combination, in different plants. From four-fifths to ninety-nine-hundredths of the dry matter of nearly all plants is composed of the four elements — oxygen, hydrogen, nitrogen and carbon. These are driven off by burning, and are termed the *organic* elements. The ashes which remain after the combustion of any plant, and which constitute but a small proportion of its bulk, are composed of the following eight substances, four of which are alkaline and four acid, viz: Potash, Soda, Lime and Magnesia; Phosphoric Acid, Sulphuric Acid, Chlorine and Silica. All plants and animals are composed of these twelve substances. All soils capable of sustaining vegetable life contain every one of them. The difference between a poor soil and a productive one, is not that the former is *destitute* of one or more of these substances, but that it does not contain them, in an available form, in sufficient quantities, and in the proper proportion, for the maximum growth of plants. As a general rule, too, a soil destitute of one substance, is destitute of others; so that we cannot hope to render a soil productive for any great length of time by the application of a manure containing only one or two of the elements of plants. Such special manures, however, may occasionally be used with considerable advantage, as we shall endeavor to show in the course of this article.

As all plants and animals contain every one of the twelve substances named, it follows that all manures of animal or vegetable origin that have not undergone combustion, also contain each one of them. Such manures as barn-yard dung, night-soil, fish, guano, &c., furnish the soil all the elements needed for the growth of plants, though not necessarily in the best proportions. Ashes contain *all* the eight *inorganic* elements.

The four organic elements of plants exist in the atmosphere, and are brought to the soil in rain and dew, and, under favorable circumstances, are attracted and absorbed by the soil itself. The leaves of plants, also, have the power of absorbing them from the air. The eight inorganic elements are obtained only from the soil, or from manures. The atmosphere does not contain them, though traces of them have been found, under peculiar circumstances, in rain-water.

From the fact that plants can obtain their organic elements from the atmosphere, it has been asserted that the principal object of the farmer and gardener should be to provide the plants with inorganic food — that if they had this in sufficient quantity, and in proper proportions, the atmosphere would supply all the organic food required. Now, that

there is a just balance between the supply of atmospheric and soil constituents, is quite probable. In a state of nature, it may be true that plants obtain from the atmosphere all the organic food they require, and that their growth is regulated by the supply of inorganic food from the soil. But the moment we commence to *cultivate* the soil, we increase the supply of inorganic food, while the supply from the atmosphere remains the same. If, too, organic manures were valueless, there would be no inducement to collect and apply them; and as it is the gases arising from their decomposition that are so offensive and injurious to animal life, one of the most powerful motives to cleanliness would be removed. From *a priori* reasoning, therefore, we should conclude that organic manures, so far from being useless, are of great value. If we increase, by artificial means, the supply of inorganic plant food by the application of mineral manures, we must, to keep up the natural "balance of organic nature," also increase the supply of *atmospheric* plant food. *This conclusion is confirmed by practical experience.*

The inorganic elements of plants can be obtained at a much cheaper rate than the organic elements, especially of nitrogen. Thus, a ton of ordinary barn-yard dung contains

Water,	1589
Carbonaceous matter (oxygen, hydrogen and carbon),	272
Nitrogen,	8
Potash and Soda,	11
Lime,	12
Magnesia,	5
Phosphoric Acid,	4
Sulphuric Acid,	3
Chlorine,	1
Silica, or sand,	89
Oxide of Iron and Alumina,	6
	2000

In estimating the value of these substances, we must ascertain their cost in other forms. A bushel of unleached wood ashes, 10 lbs. of common salt, 6 lbs. of bones and 2 lbs. of plaster, contain as much potash, soda, lime, magnesia, phosphoric acid, sulphuric acid and chlorine, as one ton of barn-yard dung. The silica or sand, the oxide of iron, and the alumina (clay), we may, for obvious reasons, leave out of the question. Now, these substances can be purchased in this city for less than fifteen cents, and it is, therefore, fair to assume that the inorganic matter of a ton of barn-yard manure is not worth more than fifteen cents. The 272 lbs. of carbonaceous matter can be obtained from four or five hundred pounds of dry muck, which would furnish, in addition, several pounds of ashes, and a pound or two of nitrogen. So that we cannot estimate the value of 272 lbs. carbonaceous matter higher than five cents. The value of a ton of barn-yard manure, therefore, exclusive of the nitrogen which it contains, may be estimated at about twenty cents. The value of the remaining eight lbs. of nitrogen will depend on the price it can be obtained from other sources, or on the cost of a ton of barn-yard manure, delivered on the land. If we estimate

it at one dollar, it is evident that the eight pounds of nitrogen are worth eighty cents, or ten cents per pound. If at a dollar and a half a ton, the nitrogen will be worth over fourteen cents per pound. In England, nitrogen is usually estimated to be worth fifteen cents per pound, and it cannot be purchased at present in Peruvian guano — its cheapest artificial source — for less than sixteen cents per pound. Estimating it, however, at ten cents, it will be seen that the eight pounds of nitrogen in a ton of barn-yard manure is worth *four times as much as all the other constituents of the manure.*

While, therefore, the twelve inorganic elements are indispensable to the growth of all plants, and the carbonaceous substances oftentimes of considerable benefit, if it was necessary to supply plants with no other food than these, manuring would be a cheap and easy matter. But it has been demonstrated, by repeated experiments, that these substances will not supply the place of barn-yard manure. Plants require for their maximum growth a greater quantity of nitrogen than the rain, dew and atmosphere can supply, and it is wisely ordered that this element, which is the chief cause of all offensive putrefaction, is not only the most expensive, but usually the most beneficial, ingredient of all manures.

In the preparation of manures, therefore, the chief object of the farmer and gardener should be to get as much nitrogen as possible; for nitrogen is not only the most expensive and beneficial ingredient of manures, but there is no natural method of obtaining it which does not at the same time furnish the other elements of plant-food in the same ratio.

The composition of the food consumed by the animals, determines, primarily, the composition and value of the manure. During the process of nutrition, the carbonaceous matter of the food is burnt in the lungs, and forms carbonic acid and water, which are given off in the breath, perspiration, &c. About one-half of the organic matter of the food is lost in this way. On the other hand, *nearly all* the nitrogen, and the inorganic elements of the food, are voided in the liquid and solid excrements — the only loss being the small quantity retained in the formation of new flesh, bones, &c., which, in proportion to the quantity consumed in the food, is very small. The loss of carbonaceous matter is of little consequence, as there is still enough left in the manure, in proportion to other ingredients, to supply plants with all the carbonic acid they require. The manure, therefore, made from a given quantity of food, is nearly as valuable as if the food itself were applied to the soil, while it has the additional advantage, when judiciously fermented, of being less in bulk, and in a more appropriate condition for assimilation by plants.

Much has been written in regard to the relative value of the manure from horses, cattle, sheep, pigs, &c. If the food were the same, there would be little if any difference in the value of the manure. One hundred pounds of hay, eaten by a horse, an ox, or a sheep, would furnish manure, differing, perhaps, in quantity, but of precisely the same value.

If hog-manure is more valuable than that of horses, cattle or sheep, it is owing to the fact that the hog is usually fed on richer and more concentrated food. For the same reason, horse-manure is usually more valuable than that of cattle and sheep. Feed cattle on oil-cake and hay, and the manure would be much *more* valuable than that of horses fed on the same quantity of oats and hay, simply because the oil-cake contains twice as much nitrogen, phosphates, &c., as oats. A flock of sheep fed on clover hay, and peas or beans, would furnish manure *ten times as valuable* as a flock fed on straw.

Preservation of Manure.—If manure could be buried in the soil in its fresh state, there would be no loss of its fertilizing elements, and, *ceteris paribus*, this is the best way to apply it. But it is generally inconvenient, and often impossible, to do so. It is generally applied in the spring and fall, and much of it must, therefore, be preserved at least for some months. Again, manure must be reduced to the last stage of decomposition before it becomes healthy plant-food. Gardeners are well aware that fresh urine, however dilute, is injurious to plants. Its urea must be changed into carbonate of ammonia before it becomes fit for assimilation by plants, and this is accomplished only by fermentation. For many kinds of vegetables, too, it is desirable to have manure that acts as quick as possible. Rapid growth renders them more succulent and tender. Manure applied in the spring, for immediate effect, must be soluble, and in a condition for direct assimilation by the plants, and must also be incorporated intimately with the soil. These conditions can only be obtained by judicious fermentation in the barn-yard or compost heap.

When manure is thrown loosely into a heap, rapid fermentation soon sets in. The nitrogenous compounds are converted into carbonate of ammonia, which, being lighter than the surrounding atmosphere, flies off and is lost. Now, as nitrogen (or, in other words, ammonia,) is the most valuable ingredient of the manure, this rapid fermentation is exceedingly injurious. One-half of the value of the manure is often thus dissipated. Manure, however, *can be fermented, and reduced in bulk and weight fully one-half, without any material loss of ammonia.* To accomplish this in an ordinary farm-yard, the droppings from the horses and sheep, which ferment readily, should be mixed with those from pigs and cattle, which are of a colder, saponaceous nature, and decompose slowly. Such a heap, covered with waste litter, and compressed by allowing the animals to trample it down, will ferment gradually, and retain nearly all the ammonia.

By far the greater portion of the nitrogen of the food consumed by animals is found in the urine. It is of the first importance, therefore, that this be carefully preserved. On farms where straw is abundant this is not difficult, if the barn-yard is properly constructed, the buildings all spouted, and a tank provided for retaining the excess of liquid at certain seasons. Without these it is impossible, and great as is the loss of ammonia from injurious fermentation, it is even still greater from the prevalent practice of allowing the drainage of the barn-yard to run

to waste, especially where the water falling on the buildings is allowed to run on to the manure heap and wash out its soluble (and most valuable) constituents.

Moisture and air are essential to fermentation. By compressing manure we exclude the air, and thus retard fermentation, and an excess of water has the same effect from the same cause. The barn-yard, therefore, must be so constructed that all excess of water will drain off into the tank. If the heap gets somewhat too dry, as will frequently be the case if it consists principally of horse-dung, it soon becomes very hot, and will "fire fang," with much loss of ammonia. To avoid this, the drainage in the tank must be pumped back on to the heap. The tank-water is the great regulator. It contains a considerable quantity of nitrogenous substances in a state of fermentation, which have the power, like yeast, of inducing fermentation in other bodies. If, therefore, the heap is cold, from an excess of hog-manure, cow-dung, or straw, or from any other cause — except a superabundance of water, which will never be the case if the drainage into the tank is good — active fermentation may be induced by saturating the heap with the liquid from the tank, especially if it is not diluted with water from the buildings, &c. On the other hand, injurious fermentation may be arrested by the same means.

Water has a very strong affinity for ammonia; and the judicious use of the drainage in the tank will, to a very considerable extent, prevent its escape. If a quantity of sulphate of lime (gypsum or plaster) were occasionally thrown into the tank, it would prove beneficial, as sulphate of lime, *in solution*, has the power of changing the volatile carbonate of ammonia into sulphate of ammonia, which is not volatile. *In the dry state, it does not possess this power.* When it can be applied in solution, there is no other chemical "fixer" of ammonia that can compare with it in cheapness and efficacy. Its only drawback is its comparative insolubility — four hundred pounds of water being required to dissolve one pound of plaster. Still, as it is itself a fertilizer, cheap, and, when dissolved, efficacious, all liquid manure should at all times be kept saturated with it.

Sulphate of lime, in solution, not only arrests the ammonia, but is supposed, also, to accelerate fermentation. By keeping the heap constantly moist with sulphated drainage water, the manure may be reduced in weight and bulk fully one-half, with little loss of ammonia. It would be "spit manure," of the richest and most active kind, and would prove of great benefit to all succulent vegetables.

Applying Manure in the Fresh State.—As we have said before, there can be no doubt that the surest way of preventing all loss of fertilizing elements, is to bury the manure in its fresh state. This can sometimes be done with considerable advantage, especially on heavy land. Long, strawy manure ameliorates a hard, compact clay soil, rendering it light and porous; and the nascent gases arising from its slow decomposition correct the rawness of the soil, and convert some of the dormant matter into available plant-food. In trenching a garden

with a clay subsoil, fresh manure incorporated with the bottom spit is exceedingly beneficial. The raw subsoil, as a general rule, however, should not be brought to the surface. All vacant land in the garden and orchard should be dug or ridged in the autumn, and fresh manure may be advantageously applied at this time. There is little danger of the soluble portions of the manure being washed out, unless in very sandy soil. The double silicates existing in clay soils will retain all the ammonia eliminated by the decomposition of the manure, and by the following spring the soil will be impregnated with the elements of plants in a fit state for direct assimilation. In the spring, a little rich and well-rotted manure should be added to the soil, to give the plants a start, and stimulate their early growth till the roots get a firm hold of the soil. Two or three pounds of Peruvian guano to the square rod would be, for most crops, a most excellent substitute.

Applying Manure on the Surface.—We believe there is far less loss of ammonia in spreading manure on the surface of the ground in the fall of the year, than is generally supposed. Fresh manure contains no ready-formed ammonia. It is the product of decomposition. When fresh manure is spread on the surface, and dry weather ensues, little or no decomposition will take place, from lack of moisture, and, consequently, little or no ammonia will be formed or lost. If wet weather sets in, the soluble portions of the manure will be washed into the soil, and decompose there without loss; while the ammonia formed from the slow decay of the organic matter of the dung is so exceedingly small, and water and soil have such a powerful attraction for it, that it is quite probable that by far the greater portion of it finds it way to the soil by means of dews, rain, &c., and by the attraction of the soil and the leaves of plants. If we should spread on the surface twenty tons of fresh manure, and estimate that it would decay in six months, there would be formed on each square yard about one grain of ammonia per day. But there can be no doubt that the greater part of the urea and other nitrogenous matter of the dung would be washed into the soil by rain, and there would be only an infinitesimally small quantity of ammonia formed on a square yard per day from the decay of the remaining insoluble portion of the dung. Surely, as we have said, it is not difficult to see how such a small quantity may be retained. We repeat, therefore, *the loss of ammonia from spreading fresh manure on the surface is less than is generally supposed.*

Where manure has been rotted in a heap treated with sulphate of lime in solution, as we have recommended above, the loss would be even still less, from the fact that nearly all the ammonia would be converted, in the heap, into non-volatile but soluble salts, which would be soon washed into the soil and retained there. Such manure might be applied on the surface in the fall without much loss.

Where manure is *undergoing fermentation* in an ordinary heap, and carbonate of ammonia is ready formed, there would doubtless be considerable loss in spreading it in this condition on the surface, unless during rainy weather. The loss, however, would be confined to the

first few days, or till the ready-formed ammonia had escaped. The remaining nitrogenous matter of the manure would ferment so slowly that little loss of ammonia would be sustained.

The advantage of spreading manure on the ground among young and tender trees, shrubs, plants, &c., is obvious, and as there is comparatively little loss of fertilizing elements, the practice should be more extensively adopted.

NIGHTSOIL.—From an extensive series of experiments, we learn that, on an average, men from fifteen to fifty years of age void in the course of a year 95 lbs. of fæces, and 1,049 lbs. of urine. Total solid and liquid excrements in their fresh state, 1,144 lbs. These contain of *dry substances*, — fæces, 23½ lbs.; urine, 39½ lbs. Total dry substances voided by a man in the course of a year, 63¼ lbs. This contains of *inorganic matter*, — fæces, 2½ lbs.; urine, 12 lbs. Total, 14½ lbs. Of *carbon*, — fæces, 10 lbs.; urine, 12 lbs. Total, 22 lbs. Of *nitrogen*, — fæces, 1 1-5 lbs.; urine, 10 4-5 lbs. Total, 12 lbs. Of *phosphates*, — fæces, 1½ lbs.; urine, 4¼ lbs. Total, 5¾ lbs.

These figures are the mean result of a most careful series of experiments, and their accuracy can be relied on. The most valuable constituents of nightsoil, as of all other manures, are the nitrogen (ammonia) and phosphates. Of the former, a man voids in the course of the year, 12 lbs.; of the latter, 5¾ lbs. In barn-yard manure at $1.50 per ton, nitrogen costs 14 cents per lb. At this estimate, the nitrogen in the annual excrements of a man is worth $1.68. The phosphates in nightsoil are more soluble than in barn-yard dung, and we will, therefore, estimate them at double the price they can be obtained in bones — say 2 cents per lb., or 12 cents. Calling the remainder of the mineral matter worth 20 cents (a somewhat too liberal estimate, it must be confessed), we have $2 as the annual value of nightsoil from one person.

It will be seen that the urine contains nine times as much ammonia as the solids, and is undoubtedly nine times as valuable, as, besides the ammonia, it contains nearly all the *soluble* phosphates and alkaline salts. In the preservation and application of nightsoil, therefore, the point of most importance is to save all the urine. When circumstances render it convenient, the best method undoubtedly is to dilute it sufficiently with water, and provide a tank for its retention till it can be applied directly to the soil, or used for moistening the manure heap or other composts. In ordinary cases, however, it cannot be applied in the liquid form, and its fertilizing elements must be retained by the use of sufficient dry muck, sawdust, charcoal, leaf mould, soil, or other deodorizing matter, to absorb the liquid. Unless a large quantity of these absorbents are used, it is best to compost the nightsoil after removing it from the vault, before applying it to the soil. A little plaster scattered occasionally in the vault would do no harm, and so much of it as was dissolved would prove useful in "fixing" the ammonia.

THE POUDRETTE OF COMMERCE we regard as a very indifferent fertilizer, not worth half the price at which it is sold. In saying this, we do

not accuse the manufacturers of dishonesty. The fact is, it is impossible to make a highly concentrated fertilizer from the ordinary night-soil of our large cities. If the urine could be retained, and all the water driven off by evaporation without loss of ammonia, a most valuable fertilizer would be obtained; but there is no known method of doing this, that is sufficiently economical. The poudrette of commerce is usually made from the more solid portions of nightsoil, which are comparatively poor in fertilizing matter, and the deodorizing and absorbing material increases its bulk and weight to such a degree that it is little better than rich, well-rotted farm-yard dung.

Peruvian Guano.—This celebrated fertilizer is nothing more nor less than the excrements of birds which feed on fish. Common poultry-dung is often supposed to be as good a fertilizer as guano; but such is not the case, from the fact that our domestic poultry do not live on such highly nitrogenous food. The dung of fowls living on corn would be no stronger than that from pigs living on the same food, *if all the urine of the latter was saved*, and both manures were brought to the same degree of dryness. The guano birds live on the most highly nitrogenous of foods, and all the nitrogen is excreted in the dung. This is deposited in a hot, rainless region, and undergoes little if any fermentation. All its fertilizing matter is retained. It is simply dried fish, *ground up exceedingly fine*, and nearly all the carbonaceous matter burned out. Such is guano in its best form. It contains sometimes as much as twenty-three per cent. of ammonia — or rather nitrogen capable of yielding this quantity of ammonia by fermentation, for a good, "*sound*" guano contains very little *ready-formed* ammonia. Ammonia, in all cases, is the product of fermentation. *Fresh* animal excrements never contain it; and when it is found in guano, it is an indication that the guano has been damaged by fermentation, in consequence of the presence of water. The more potential and the less actual ammonia a guano contains, the more valuable it is. The advice so often given, to mix plaster, superphosphate, sulphuric acid, salt, &c., with guano, for the purpose of "fixing" the ammonia, is founded on the erroneous idea that the ammonia in guano is ready formed, and that it will escape on exposure to the air. *With good guano, there is no necessity for such admixture.* The only precaution necessary, is to keep the guano perfectly dry. Wet it, and rapid fermentation immediately sets in, with great loss of ammonia. Keep it dry till it is sown on the ground, and then mix it with the soil, and there will be little, if any, loss of ammonia. It is well, however, to avoid unnecessary exposure, as guano will absorb moisture from the atmosphere, and a slight fermentation and loss of ammonia would be the consequence.

An immense number of analyses of Peruvian guano have been made, and from these we learn that, on an average, 100 lbs. contain: water, 13; non-nitrogenous organic matter, 30; ammonia, 17; phosphoric acid, 14; sulphuric acid, 4; chlorine, 1; potash, 3; soda, 2; magnesia, 1 (nearly); lime, 12; sand, silica, and oxide of iron, 3.

It will be seen that guano contains *all* the elements of plants. It is

in no sense a *special* manure. It differs from farm-yard manure only in containing a greater proportion of ammonia and phosphates, and less carbonaceous matter, silica, &c. The ammonia and phosphates are, to a great extent, in an available condition, and are taken up by the plants the first season. On ordinary soils, and for most plants, ammonia and phosphates are required in a greater relative proportion than any other ingredient of plant-food. This fact accounts for the marvelous effect of Peruvian guano — it supplies, in an available condition, an abundance of those substances most required for the maximum growth of nearly all cultivated plants. It has, however, a better effect on some plants than on others; for instance, it is undoubtedly, on most soils, the best manure in the world for wheat, while it is not so well adapted for turnips. It increases the growth of turnips, but causes the plants to run to leaves rather than to bulbs. It increases the growth of peas, but has a tendency to produce vines rather than pods. We believe it will increase the growth of all plants, when judiciously used; but whether a less nitrogenous manure would not be more advantageous on some plants, is a point which can be ascertained only by experiment. On horticultural plants, trees, shrubs, &c., we have few experiments that afford any certain proof on this point. Such as we have, seem to indicate that guano has a very good effect on dwarf pear trees, grape vines, evergreens, flowering shrubs, bedding plants and green-house flowers. It has been used on young peach trees in the nursery rows with the most beneficial result. It is one of the very best manures known for potatoes, sometimes doubling the crop. For onions, carrots, beets, cabbage, cauliflowers and rhubarb, there is nothing equal to it, that we have used. It is also said to be very good for celery, tomatoes, melons, cucumbers, strawberries, &c. In fact, as we have said before, we know scarcely a plant cultivated in our gardens and orchards to which it cannot be applied with more or less advantage — though it is probable that, as our knowledge of the manurial requirements of plants increases, it will be found that a more *special* and more economical manure may be used on some plants with a better effect.

The quantity of guano usually applied to an acre varies from two hundred to six hundred pounds. One hundred pounds of good Peruvian guano will afford as much ammonia and phosphates, *the first year*, as three or four tons of barn-yard manure. The proper quantity to use can be determined from this fact. Those who have had no experience with it, should be careful not to use it too freely. One ounce — say a table-spoonful — to the square yard, is at the rate of about three hundred pounds per acre. When sown broadcast in any reasonable quantity, and incorporated with the soil, guano will not hurt the smallest seeds; but when sown in drills or in hills, it frequently proves injurious.

Where guano is simply used to stimulate a crop at a particular time, it is best to apply it in the liquid state; but in ordinary cases, it is quite unnecessary to be at this trouble. Many good writers recommend applying it at different times during the season, but this, also, is

unnecessary. As a general rule, it is better to apply it *early* in the spring, and mix it well with the soil. In this way it will ferment, and act beneficially on the soil, as well as on the plants. Guano, like fresh manure, must ferment before it is in a proper condition for assimilation by plants. About one-half the constituents of guano, only, are soluble in cold water — and this not the most valuable half. The insoluble portions are apt to stop up the holes in the rose of the watering can, and render the application of guano in the liquid form somewhat inconvenient. On the whole, therefore, except in special cases, we should apply guano in the dry state.

Guano is free from weeds, is easily applied, and acts quickly. No gardener who has ever used it will be willing to do without it. He must not abandon the use of barn-yard manure, but for the sake of *convenience*, if for no other reason, he will find guano an invaluable *auxillary*.

Bones.—Crushed bones are used with considerable benefit in the formation of vine borders. They decompose and afford food for the plants long after all other manures applied at the same time are exhausted. They also have a good effect when buried beneath dwarf pear and other trees. They are also useful for plants intended to be kept long in the same pot, supplying at once food and drainage. When ground fine, their effect is more immediate and beneficial, though in this state, even, they are a "lasting" manure. The most valuable ingredients of bones are phosphate of lime and gelatine. They contain about fifty per cent. of the former, and of the latter sufficient to afford, when decomposed, about six per cent. of ammonia, or twelve times as much as farm-yard manure. Of phosphate of lime, they contain forty times as much as manure.

Superphosphate of Lime.—This valuable artificial manure is made from bones, or other substances containing phosphate of lime. Pure superphosphate of lime is simply *calcined bone-dust in a soluble form*. Burnt bones contain about eighty per cent. of phosphate of lime, but it is in an insoluble form. This insoluble phosphate of lime contains three atoms of lime united with one of phosphoric acid. *Soluble* phosphate of lime (or superphosphate) contains one atom of lime united with one atom of phosphoric acid. To convert the one into the other, we have to take away two atoms of lime. This is accomplished by mixing sulphuric acid (which has a stronger affinity for lime than phosphoric acid) with bone-dust, or other substances containing phosphate of lime.

The sulphuric acid does not "*dissolve*" the bones — it merely decomposes them, and renders them soluble. Unfortunately, sulphuric acid will not decompose, completely, unground bones. In making superphosphate, the first thing to be done is to grind the bones as fine as possible. If we burn them, the ammonia, which constitutes at least one-half the value of bones, is driven off and lost, and the ash which remains, though more readily decomposed than the fresh, unground bones, will not make a good article of superphosphate unless it is ground.

With fine bone-dust, it is easy to make superphosphate. Take a large tub, or end of a cask; place in it the quantity of bone-dust that can be best worked at a time — say 60 lbs.; add water sufficient to wet all the bone-bust — say 40 lbs. — and be careful to stir it till all the bone-dust is moistened. Then pour on common sulphuric acid (sp. gr. 1.70) equal to full one-third the weight of the bone-dust — say 20 to 25 lbs. The mass should be briskly stirred as soon as the acid is added. When it is well mixed, throw the semi-fluid mass into a heap on a wooden floor, and repeat the process till all the materials are used up.

A tolerably good superphosphate may be made with less labor, by placing all the bone-dust at once in a heap on a wooden floor, adding the proper quantity of water, and turning over the heap till all the dust is moistened, and then applying the sulphuric acid in small quantities, repeatedly shoveling over the heap and adding the acid as fast as it is absorbed, till the proper quantity is used.

If calcined bone-dust is used, more sulphuric acid and water must be employed, as the proportion of phosphates is much greater. Take 60 lbs. of burnt bones and mix them with 30 lbs. of water, and then add 40 lbs. of acid, stirring the mixture briskly, as before.

Superphosphate of lime, made as above, can be sown with the smallest seeds without injury. Unlike guano, superphosphate should always be sown in the drills or in the hills, in direct contact with the seed. When sown broadcast, much of its effect is lost. Its most characteristic effect is in promoting the formation of fibrous roots, and in giving the plants an early start. On turnips, lettuce and radishes, superphosphate has an astonishing effect. We believe it will also be found an excellent manure for cabbage, melons, cucumbers, beans, tomatoes, and nearly all garden vegetables, except the potato.

Neither guano nor superphosphate should be mixed with unleached wood ashes, or lime, as in such case the ammonia of the guano would be driven off, and the soluble phosphate of the superphosphate be changed back again into the insoluble form. English writers, we know, recommend "ashes" for mixing with guano and superphosphate, for greater convenience in sowing, but they refer to coal ashes, which, containing little alkali or alkaline earth, are not injurious.

If good superphosphate of lime could be obtained in market at a fair price, we should not advise our readers to make their own; but there is so much incompetency and rascality among the manufacturers of this article, that there is no certainty of getting a manure worth half what is asked for it.

Horn Piths.—These can often be obtained at a cheap rate from the tanneries. They resemble bone very much in composition, but contain a little more animal matter, and, from their softness and porosity, are more difficult to crush in the mill. For the same reason, they decay more rapidly in the soil, and act more immediately than bones. It is quite probable, too, that (from their softness and porosity) they might be made into superphosphate without being ground. If so, they would

make an excellent article, as they contain forty-six per cent. of phosphate of lime, and thirty-six per cent. of gelatine (say eight per cent. of ammona).

Animal Substances.—The horticulturist should avail himself of all animal substances. They possess great fertilizing properties. They contain, in the dry state, more nitrogen (ammonia) than the best samples of guano. Flesh, fish and blood, in their fresh state, contain eighty per cent. of water, but readily decompose, and are active and powerful fertilizers. Horn-shavings, woolen rags, hair, skin, and hoof-parings, have the same composition as *dry* fish, flesh and blood. One ton of them ought to enrich the soil as much as four or five tons of the former, but, on account of their dryness and density, they decompose slowly, and produce less effect at first, but are much more lasting. Probably the best way to use them is to make them into a compost, or mix them with manure in a heap. If they were thrown into the liquid manure tank and soaked for a few months, they would decompose afterwards more rapidly. For enriching grape borders, asparagus and strawberry beds, and for all purposes where it is desirable to make the soil permanently rich to a considerable depth, they may be dug in to the subsoil with considerable advantage.

It is well known that blood applied directly to the roots of plants is always injurious, and in most cases destructive. It should be mixed with the soil for a sufficient length of time for it to ferment, before the roots of plants come in contact with it. The same is true of fish and flesh. In some cases, perhaps, a better way would be to make them into a compost with muck, old sods, earth, &c. Such a compost, when decomposed thoroughly, would be a most valuable manure, and one which could be applied directly to the roots of all plants.

Lime.—This substance has a two-fold action. It supplies an actual constituent of all plants, and is in this sense a manure. It also exerts a beneficial effect on the constituents of plants in the soil, rendering the potash soluble, and accelerating the decomposition of organic matter, as well as in other ways changing the organic and inorganic substances in the soil into healthy plant-food. The ordinary manures used in a garden contain all the lime that plants require. Unless the soil is naturally deficient in lime, therefore, there will seldom be any necessity of applying lime to a garden for the purpose of supplying plants with it. They will get all they need from other manures. Where plaster (sulphate of lime) is used in the preparation of the manure, as we have recommended, there will be even less necessity for the use of lime applied directly as a manure. If lime is useful in gardens, therefore, it must be owing to its action on other substances in the soil. On recently underdrained low land, lime has frequently a beneficial effect. It renders deleterious salts of iron — sometimes found in such soils, especially those of a mucky character — innoxious, and "sweetens" the soil. It sets free the potash and ammonia of clay soils, and also has a tendency to make them light and porous. On such soils, experience seems to indicate that it is better to apply the

lime at once in large quantity — say at the rate of one hundred bushels per acre — than at several times in smaller doses. Lime appears to make light, sandy soils somewhat more compact, and more retentive of moisture. It also destroys worms, slugs, &c. On all soils abounding in organic matter, particularly those of a mucky nature, we should expect lime to be beneficial; but it must be confessed that we need more definite experiments with lime on gardens and orchards to enable us to speak in detail on this subject.

Wood Ashes.—These contain all the inorganic elements of plants, varying considerably, however, in the relative proportion, according to the kind of wood from which they are obtained. All hard wood ashes abound in potash and soda, and their effect is generally to be ascribed to these substances. Nearly all kinds of fruit contain a considerable quantity of potash and soda. For instance, the ash of apples contains 35 per cent. of potash and 26 per cent. of soda; the ash of pears, 54 per cent. of potash and 8 per cent. of soda; the ash of cherries, 51 per cent. of potash and 1 per cent. of soda; the ash of Green Gage plums, 59 per cent. of potash and half of one per cent. of soda. Looking at these figures, we should suppose that the cultivation of fruit draws heavily on the soil for potash, and that ashes would be found a valuable manure for orchards, especially those from which fruit has been removed for many years. But the truth is, that, though the ash of the fruits named contains a large proportion of potash, the fruits themselves contain but comparatively little ash. Ten thousand pounds of apples — say 200 bushels — contain only twenty-seven pounds of ashes. There are few orchards that yield annually 200 bushels of apples per acre, and this quantity of fruit removes from the soil less than 10 lbs. of potash and 6 lbs. of soda. This is very much less than is removed by the ordinary crops raised on a farm. Thus, a crop of either wheat or barley, of 20 bushels, removes in grain and straw 20 lbs. of potash. A crop of oats, of 50 bushels, removes in straw and grain 42 lbs. of potash and 18 lbs. of soda. A crop of rye, of 25 bushels, removes in grain and straw 34 lbs. of potash. A crop of beans (English Horse beans), of 25 bushels, removes in grain and straw 111 lbs. of potash. A crop of red clover hay, of 1½ tons, removes from the soil 48 lbs. of potash and 160 lbs. of soda. Contrary to the usual belief, therefore, apples remove from the soil less potash and soda than the ordinary plants cultivated on a farm.

If apple trees are supplied with half the manure necessary for the growth of ordinary farm crops, they will be amply provided with all the potash and soda required. Where an orchard has been impoverished by the growth of other crops among the trees, and where it is not convenient to apply barn-yard manure, ashes and plaster may be used with good effect. Perhaps the best way to apply them, is to sow them on clover or buckwheat, to be plowed under. In this way the soil would be supplied with organic matter, as well as with all the inorganic elements of plants.

Leached Ashes.—These differ from unleached ashes in containing

less potash and soda, and more phosphates, lime, sulphuric acid, &c. When they have been exposed to the atmosphere for a long time, it is probable that they contain nitric acid and ammonia, absorbed from the atmosphere. This may account for the fact that, on some crops, they have a better effect than unleached ashes. Be this as it may, experience shows them to be a valuable manure, especially on light, dry soils.

Gypsum, or Plaster (*Sulphate of Lime*).—This manure is most effective on dry, sandy soils. It frequently has a good effect on peas, potatoes and corn; and from its remarkable action on clover, would seem to be specially adapted for leguminous plants. We have had little experience with it on fruit trees.

Peat, Swamp Muck, &c.—These substances — containing as they do, in the dry state, some seventy per cent. of organic matter — are of great value to the horticulturist. They are most beneficial on dry, sandy soils, which are often deficient in organic matter. It is well known that these substances not only supply plants with food, but also render the soil more retentive of moisture. Nearly all garden vegetables require more carbonaceous matter in the soil than wheat and other cereals. The same is probably true of fruit trees, and especially of many kinds of evergreens.

The best way to prepare swamp muck, peat, &c., is to throw it up to dry, and then compost it with horse-manure, and with rich, animal substances, that ferment rapidly. The ammonia developed by the fermentation of these substances neutralizes the acid of the muck, and a valuable manure is the result. When it is not convenient to do this, a little lime or ashes may be mixed with the muck, in order to neutralize the acid and induce fermentation.

Leaves of Trees.—These should be raked up and made into a compost, or dug into the soil. They contain nearly three times as much nitrogen as barn-yard manure, and are, therefore, nearly three times as valuable. They should never be burned. Made into a compost with seedless weeds and a little fresh manure, they will afford a rich compost in the spring. If covered with muck or soil and kept moderately moist with soap-suds, or other liquid from the house, they will be still more valuable.

The following table, showing the value of numerous substances used as manures, cannot but prove useful as a matter of reference. It is taken, principally, from the last edition of Boussingault's *Rural Economy*. In the first edition, this illustrious author estimated the value of manuring substances solely by the nitrogen they contained, but in the last edition he also gave an estimate of their value deduced from the phosphoric acid, and which we now publish for the first time in this country. Nitrogen (ammonia) and phosphoric acid are the two most valuable ingredients of all manures, and the following estimate may be considered a tolerably correct one. The figures show the amount of the various substances which are equal in manurial value to one hundred pounds of ordinary farm-yard manure.

Table Representing the Comparative Value of Different Manuring Substances.

Description of Substances.	Per centage of water.	Per centage of nitrogen.		Per cent. of phosphoric acid.	Equivalents derived from the per centage of nitrogen.		Equivalents derived from the per centage of phosphoric acid.	
		Dry substance.	Natural state.	Dry substance.	Dry substance.	Natural state.	Dry substance.	Natural state.
Farm-yard manure	79.0	2.00	0.41	1.00				
do do	65.0	1.80	0.63	2.24				
do do	60.6	2.08	0.79					
Manure of the Jardin des Plantes,	58.5	1.29	0.53	1.21				
Farm-yard manure from Grignon,	70.5	2.45	0.72	2.00				
Manure of a menagerie,	66.8	1.60	0.53	0.78				
Mixed manure,	66.7	1.87	0.60	1.45	100.0	100.0	100.0	100.0
Wheat-straw,	19.3	0.30	0.24	0.22	623.3	250.0	659.1	266.7
do	5.3	0.53	0.49	0.21	352.8	122.5	690.5	240.0
Rye-straw,	12.2	0.20	0.17	0.15	935.0	352.9	966.6	369.2
do	12.6	0.50	0.42		374.0	142.9		
Oat-straw,	21.0	0.36	0.28	0.21	519.4	214.2	690.5	300.0
Barley-straw,	11.0	0.26	0.23	0.20	719.2	260.9	725.0	266.7
Pea-straw,	8.5	1.95	1.79		95.9	33.5		
Millet-straw,	19.0	0.96	0.78		194.8	76.9		
Buckwheat-straw,	11.6	0.54	0.48		346.3	125.0		
Lentil-straw,	9.2	1.12	1.01		166.9	59.4		
Dry stems of Topinambour,	12.9	0.43	0.37		434.9	162.1		
Leaves of Madia,	14.3	0.66	0.57		283.3	105.3		
Leaves of rape,	12.8	0.86	0.75	0.30	217.4	80.0	483.3	184.6
Potato leaves,	76.0	2.30	0.55		81.3	109.1		
Leaves of carrots,	70.9	2.94	0.85		63.6	70.6		
Oak leaves,	25.0	1.57	1.18		119.1	50.8		
Poplar leaves,	51.1	1.17	0.54		159.9	111.1		
Beach leaves,	39.3	1.91	1.18		97.9	50.8		
Acacia leaves,	53.6	1.56	0.72		119.9	83.3		
Box,	59.3	2.89	1.17		64.7	51.3		
Roots of clover,	9.7	1.77	1.61		105.6	37.3		
Fucus digitatus,	39.2	1.41	0.86	0.49	132.6	69.8	295.9	160.0
Fucus saccharinus,	40.0	2.29	1.38	0.19	81.7	44.9	763.2	436.4
Fucus saccharinus,	75.5		0.54			111.1		
Sawdust of fir,	24.0	0.31	0.23	0.03	603.2	260.9	4833.3	2400.0
Sawdust of oak,	26.0	0.72	0.54	0.04	259.7	111.1	3625.0	1600.0
Malt-dust,	6.0	4.90	4.51		38.2	13.3		
Lupins (seed),	10.5	4.55	3.49		43.0	17.2		
Apple refuse,	6.4	0.63	0.59		296.6	101.7		
Hop refuse,	73.0	2.23	0.56		83.8	101.8		
Beet-root refuse,	70.0	1.26	0.38	0.40	148.4	137.9	362.5	400.0
Potato refuse (from starch manufacture),	73.0	1.95	0.53	0.44	95.9	113.2	329.5	200.0
Water of starch manufactories,	99.2	8.28	0.07		22.6	857.1		
Linseed-cake,	13.4	6.00	5.20	3.83	31.2	12.5	37.8	14.5
Rape-cake,	10.5	5.50	4.92	4.34	34.0	12.2	33.4	12.4

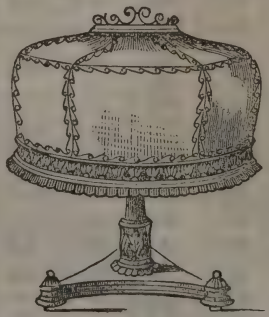
TABLE REPRESENTING THE COMPARATIVE VALUE OF DIFFERENT MANURING SUBSTANCES. — *Continued.*

DESCRIPTION OF SUBSTANCES.	Per centage of water.	Per centage of nitrogen.		Per cent of phosphoric acid.	Equivalents derived from the per centage of nitrogen.		Equivvlents derived from the per centage of phosphoric acid.	
		Dry substance.	Natural state.	Dry substance.	Day substance.	Natural state.	Dry substance.	Natural state.
Madia-cake,	11.2	5.70	5.06	3.83	32.8	11.8	37.8	14.1
Hemp-cake,	5.0	4.78	4.21	1.08	39.2	14.2	134.2	46.6
Poppy-cake,	6.0	5.70	5.36		32.8	11.2		
Beachnut-cake,	6.2	3.53	3.31	1.16	53.0	18.1	125.0	44.0
Walnut-cake,	6.0	5.59	5.24	1.48	33.4	11.4	98.0	34.5
Cotton-seed-cake,	11.0	4.52	4.02		41.4	14.9		
Pulp of olives,			7.38			8.1		
Cow-dung,	85.9	2.30	0.32	0.74	81.3	187.5	195.9	480.0
Cow urine,	88.3	3.80	0.44	0.00	49.2	136.4	0.0	0.0
Excrements of a cow,	84.3	2.59	0.41	0.55	72.2	146.3	263.6	533.3
Excrem'ts of a horse,	75.3	2.21	0.55	1.22	84.6	109.1	118.8	160.0
Horse urine,	79.1	12.50	2.61	0.00	15.2	22.9	0.0	0.0
do	91.0	16.44	1.48	0.00	11.4	40.5	0.0	0.0
Horse excrements,	75.4	3.02	0.74	1.12	61.9	81.1	129.5	178.9
Pig's excrements,	89.0	4.40	0.70	3.87	42.5	85.7	37.5	77.4
Pig's urine,	97.9	11.00	0.23	2.09	17.0	260.9	69.0	1200.0
Pig's excrements,	93.8	5.95	0.37	3.44	31.4	162.2	42.2	228.6
Sheep's excrements,	57.6	1.70	0.72	1.52	110.0	83.3	95.4	75.0
Sheep's urine,	86.5	9.70	1.31	0.03	19.3	45.8	4833.3	12000.0
Sheep's dung,	67.1	2.79	0.91	1.32	67.0	65.9	109.8	111.6
Pigeon's dung,	61.8	9.12	3.48	5.88	20.5	17.2	24.7	21.3
Human excrements,	73.3	1.48	0.40	0.82	126.3	150.0	176.8	218.2
Human urine,	93.3	21.64	1.45	3.88	8.6	41.4	37.4	184.6
Human excrements,	91.0	14.67	1.33	2.85	12.7	45.1	50.9	189.6
Flemish manure,			0.20			300.0		
Poudrette of Belloni,	12.5	4.40	3.85		42.5	15.6		
Poudrette from Bercy, 1847,	13.6	2.29	1.98	2.55	81.7	30.3	56.9	21.8
Poudrette from Montfaucon,	41.4	2.67	1.56	1.08	70.0	38.5	134.3	76.2
Poudrette from Montfaucon, 1847,	28.0	2.47	1.78	4.80	75.7	33.7	30.2	13.9
Animal black,	44.6	1.96	1.09		95.4	55.2		
do	42.0	2.96	1.72		63.2	34.9		
do	44.1	2.48	1.36		75.4	44.1		
Flesh,	8.5	14.25	13.04	0.24	13.1	4.6	604.2	218.2
Blood, liquid,	81.0	15.58	2.95	1.63		20.3	88.9	154.8
Dry blood,	21.4	15.50	12.18	1.68	12.1	4.9	86.3	36.4
Coagulated and pressed blood,	73.5	17.00	4.51		11.0	13.3		
Refuse of Prussian blue,	53.4	2.80	1.31		66.7	45.8		
Boiled bones,	7.5	7.58	7.02	24.00	24.7	8.5	6.0	2.2
Boiled bones, moist,	30.0		5.31			11.3		
Unboiled bones,	8.0	8.89	6.22	22.20	21.0	9.6	6.5	2.3
Bone-dust,		7.92		24.00	23.6		6.0	
Glue refuse,	42.0	0.91	0.53		220.5	113.2		
do	33.6	5.63	3.73		33.2	16.1		
Animal black, recent		1.32		33.50	141.7		4.3	1.4

TABLE REPRESENTING THE COMPARATIVE VALUE OF DIFFERENT MANURING SUBSTANCES. — *Continued.*

DESCRIPTION OF SUBSTANCES.	Per centage of water.	Per centage of nitrogen.		Per cent. of phosphoric acid.	Equivalents derived from the per centage of nitrogen.		Equivalents derived from the per centage of phosphoric acid.	
		Dry substance.	Natural state.	Dry substance.	Dry substance.	Natural state.	Dry substance.	Natural state.
Animal black of sugar-refineries,	47.7	2.04	1.06	-------	91.7	56.6	-------	-------
Animal black of sugar-refineries,	------	2.44	------	26.00	76.6	-------	5.6	1.8
Horn-shavings,	9.0	15.78	14.36	-------	11.8	4.2	-------	-------
Feathers,	12.9	17.61	15.34	-------	10.6	3.9	-------	-------
Ox hairs,	8.9	15.12	14.78	-------	12.4	4.3	-------	-------
Woolen rags,	11.3	20.26	17.98	-------	99.2	3.3	-------	-------
Peruvian guano,	19.6	6.20	5.00	-------	30.2	12.0	-------	-------
do	11.3	15.73	13.95	-------	11.8	4.3	-------	-------
do	25.6	7.42	5.52	20.00	25.2	10.9	7.2	3.2
do	25.7	5.92	4.41	22.00	31.6	13.6	6.5	2.9
do	25.4	5.60	4.19	14.80	33.4	14.3	9.8	4.3
African guano,	25.0	8.25	6.19	17.00	22.7	9.7	8.5	3.8
Vegetable mould,	------	2.90	------	-------	64.5	-------	-------	-------
Wood soot,	5.6	1.31	1.15	1.00	142.7	52.2	145.0	51.1
Coal soot,	15.6	1.59	1.35	-------	117.6	44.4	-------	-------
Oyster shells,	17.9	0.40	0.32	0.65	467.5	187.5	223.1	90.6
Sea shells,	------	------	0.05	0.65	-------	1200.0	223.1	-------
Marl,	1.0	0.52	0.51	-------	359.6	117.6	-------	-------
Mud of the river Marlaix,	3.7	0.42	0.40	-------	445.2	150.0	-------	-------
Sea sand of the shore of Roscott,	0.5	0.14	0.13	-------	1335.7	461.5	-------	-------

WARDIAN CASES.—N. WARD, Esq., an amateur cultivator, who lived many years in the heart of the city of London, carried the cultivation of plants, even rare ones and those of difficult growth, to an amazing state of perfection, in small portable green-houses of elegant construction. These are called Wardian cases, and the accompanying engraving shows an elegant example of one for a drawing-room or saloon. The top lifts off for ventilation, and is fitted closely into a brass groove, to which all the other bars are attached. The under part also fits into a groove in the raised part of the table, and has entirely to be lifted off when the plants are introduced or arranged. The whole is made of brass, highly polished, and plate-glass bent to the necessary curves in making.



GARDEN FURNITURE.

THE following designs of arbors, seats, bridges, fences, &c., taken principally from *McIntosh's Book of the Garden*, may not be unacceptable to some of our readers.

Summer-houses are and may be constructed in a great variety of forms, and of different materials. Very neat resting houses may be formed of four-inch quartering, set upon a base of brick or stone, so as to raise the timbers one foot from the ground. These may be lined on one or both sides with boarding, and that covered with imitation basket-work, or designs formed of larch, oak, cedar, or any other wood, selecting the smooth branches; or, if desired, it may be covered with cones of various species of pines, so arranged as to produce a very pleasing effect. The rough bark of trees — oak, for

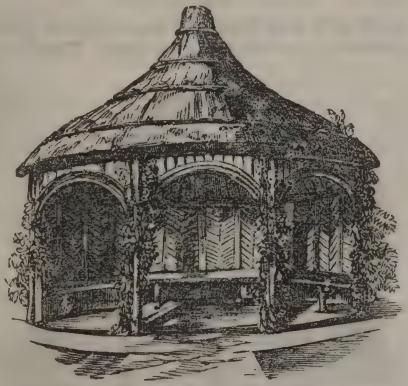


Fig. 1.

example — may be used to cover the whole, or the sides may be divided into panels, with pieces of branches or cones, and the panels filled in with smooth or rough bark, according to fancy.

Fig. 1 is a beautiful moss or summer-house, thatched with heath,

attached to the timbers of the roof with tarred cord, but, for appear-

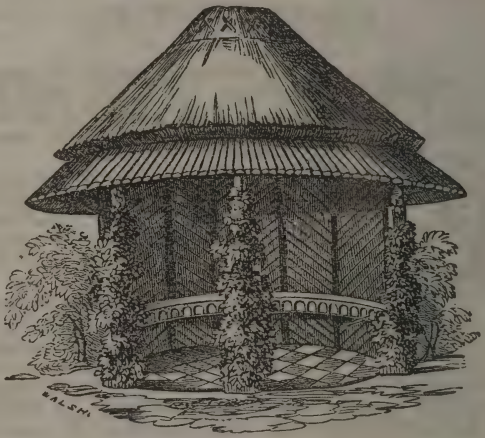


Fig. 2.

ance sake, secured with four bands of rope made of *Polytrichium commune*, or any other similar strong-growing moss. The interior of the roof

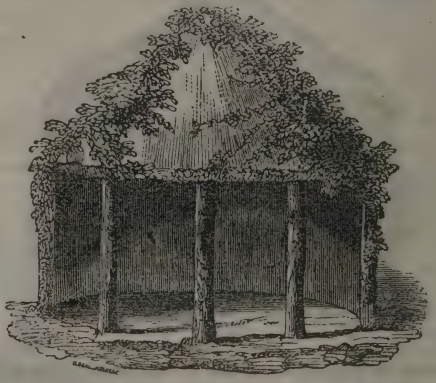


Fig. 3.

is first lathed, as it were, with hazel rods, about one inch apart, into the spaces between which mosses of various colors are thrust firmly in;

and by so doing, the whole of the roof is completely covered. The back and sides, as high as three feet above the seat, are covered with any straight-growing rods. The seat is supported upon rustic legs in front, and to the timbers of the structure behind; it is then covered with planking, and that with small rods similar to the back and sides. The front of the roof is supported upon columns of larch, oak, or any other kind of wood, having the bark on. The arches at the top are easily constructed by using two pieces of curved wood. Creeping plants are planted at their base, and trained over them and round the circular heads of the doorways. The spaces over the doorways may be either filled in with rods placed closely together, or in open lattice work, according to taste.

Fig. 4.

Fig. 2 is constructed much in the same manner, only the supports in front are set upon a stone plinth to insure their durability. The seat and covering of the back and sides are covered with rods, laid in what is called the herring-bone fashion, as seen in the sketch. The roof is in two parts, the top part being thatched with reeds, and the lower part, after being boarded over, is covered with rods, so as to give that portion the appearance of a corrugated roof. The floors of both should be pitched with different colored pebbles, set in concrete or cement, and disposed in a tessellated manner.

Fig. 5

Fig. 3 is in the simple rustic style. One-half, which forms the front, is supported upon larch or oak posts, without plinth or pediment. The roof is simply thatched with heath or reeds, and the whole exterior nearly covered with creeping roses, clematis, &c. The whole of the inside is covered with moss of the commoner kinds. The floor may be clay or dark colored concrete.

Fig. 4 is a very pretty garden seat. It may be attached to a stump, as in the drawing, or to a growing tree, which would be better.

Fig. 5 represents a pretty and simple design for a rustic seat, made of cedar, oak, larch or wild grape vine.

Metallic chairs are certainly, if we except marble or granite, the most durable; and the only objection urged against them is oxidation, which is apt to spoil ladies' dresses. This, however, can easily be got rid of, by painting them annually with anti-corrosion paint.

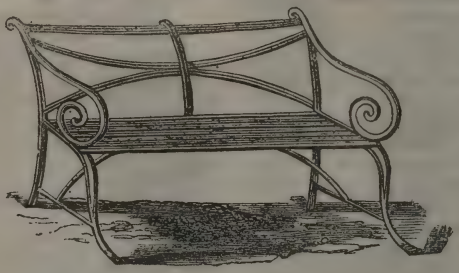


Fig. 6.

Fig. 6 is a wrought-iron chair, greatly admired for its elegant appearance, and the comfort and ease of its seat. It is less liable to be broken; and being lighter than cast-iron chairs of the same size, it is much more easily moved from place to place.

Fig. 7.

Fig. 7 is also of wrought-iron, and adapted to be fixed under the shade of a tree, as shown in the cut. It may be divided into four compartments, or not, according to fancy.

Fig. 8 is a tree-protector, often used where rabbits abound, and also for protecting single trees from injury by cattle, and are of various forms, and of different material. Those made of small iron rods, or strong wire, are not only the neatest, but the most durable, and, by a simple contrivance, may be joined by hooks and eyes, so that they may be removed from one tree to another without being taken to pieces.

The fewer fences admitted into picturesque scenery, the better. It becomes necessary, however, under certain circumstances, to introduce them as a means of protection; and when such is the case, they may be used with propriety — for what is useful cannot be in bad taste.

The varieties of fences are numerous, and range from the rudest bar-

riers, without nails or ironwork, to the highest grade of architectural pallisading. The fences admissible into the picturesque style should be of the simplest construction, and, excepting the ha-ha and *chevaux-de-frise*, chiefly of a rustic character. They are formed of young larch trees generally, on account of their being straight, and, being the thinnings of plantations, they are unfit for purposes requiring more strength.

Fig. 8.

Figs. 9 and 10 are of this description. They are generally fixed structures, although they may be easily constructed in separate pieces, and fitted up after the manner of portable hurdles. The side-posts, or uprights, should be of sufficient size to give, not only in appearance but in reality, the necessary strength. The longitudinal rails, or principal members, may be of less size; while the pieces used for the minor details should be proportionably more slender, as less strength is required of them. The chief difficulty in the construction of rustic fences, is procuring proper material; and this difficulty is increased as we depart from straight lines. When curved lines are used, then dependence must be placed on wood of a flexible nature, such as the willow, mountain or common ash, &c. Much of the elegance of such fences depends on the correctness with which the joints are fitted together; and to do this in the best manner, mitred joints only should be employed. It is also of much importance, so far as appearance goes, that the bark of the wood be carefully preserved. No doubt rustic fences

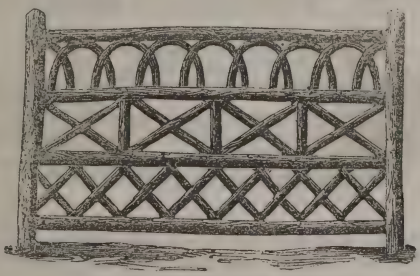


Fig. 9.

of peeled wood are often very prettily constructed; but these, till softened down by age, have a very harsh appearance, and few attempts at

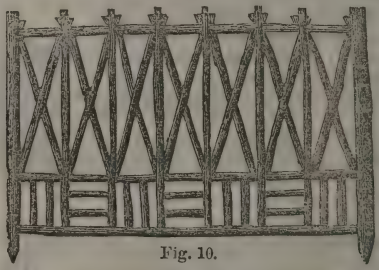


Fig. 10.

painting them have been very successful. Those colors which most nearly resemble the natural bark are the best, and greens and reds are the worst of all.

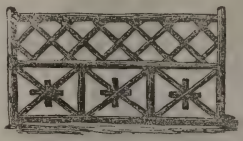


Fig. 11.

The highest grade of rustic fences is represented by fig. 11. They may be made portable, and moved about like hurdles, or be stationary and in continuous pieces as far as the fence extends. They may be barked or unbarked, according to taste, but should never, under any circumstances, be painted.

In grounds of small extent, bridges can seldom be introduced; yet there are gardens of only a few acres, crossed by a brook, where a rustic bridge would be the most appropriate and beautiful ornament that could be introduced. Fig. 12 represents one in which the bearers have

Fig. 12.

a slight curvature. The footway is covered with poles, laid across. The supports beneath are let into the abutments, which are covered with rough stones and wild plants; and although they are securely enough fastened to the bearers above, still they have the appearance of only being tied to them by a grape vine. The same occurs in the hand-rail. The bent pieces which fill the panels should each be in one

piece, if possible. Abutments to bridges, as shown in the figure, are not only of great importance to the structure itself, but they show stability and an appearance of safety. When exposed to view, they are also quite in keeping with this style, because it forms, as it were, the connecting link between the architectural and picturesque.

Fig. 13..—Here the abutments are of timber, and so selected as to have an arm, or bracket, proceeding from them for the support of the

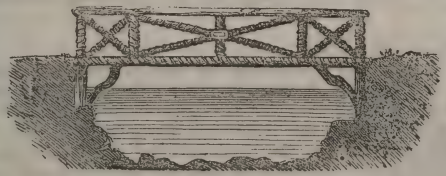


Fig. 13.

footway. These arms will look best if of the natural growth of the tree; otherwise they must be attached in the most natural manner possible. The outer sides of the outside battens in this bridge, as well as the whole of the hand-rail, should be covered with *Polytrichium commune*, twisted in form of ropes, and neatly wound round the respective parts, and nailed on the face of the battens. The top and principal rails of the hand-rail should have ropes of greater thickness than the diagonal or smaller parts. The supports underneath may be left with their natural bark attached to them.

Fig. 14.

Rustic baskets are usually formed of young larch trees, having the bark left on, the form and substance of the work being first given by a strong box or other frame of the required shape, or a barrel cut transversely through the middle. The outer surfaces of these are covered, and formed into various designs, by splitting pieces of timber of uniform size and in the requisite lengths, and, after arranging them, which is most correctly done by drawing the pattern on the surface to be covered, nailing them firmly on with small-headed nails. Fig. 14 supplies an example, where the top, being supported upon a rustic leg supported by four equally rustic brackets, is formed of one and a half inch plank. Larch, or other uniform growing rods, are nailed on the surface, the smaller ends of the rods being always kept towards the centre.

PROFITABLE FRUIT CULTURE.

WRITTEN FOR THE RURAL ANNUAL BY H. E. HOOKER, ROCHESTER, N. Y.

LOVE of gain characterizes the present age, and the first inquiry in embarking in any enterprise usually is, "Will it pay?" This spirit has invaded even the quiet circle of the gardener and the fruit cultivator, and seldom do we find a man in whom the pure love of horticultural pursuits so prevails as to drive out the idea of profit from the labor bestowed. Nevertheless, there is much to repay the care of the horticulturist, besides the proceeds of sales in the market. To the man of abundant means and pure tastes, the daily enjoyment derived from the sight of his pets of the garden, and his interest in a new and promising fruit, or the care of young seedlings from which he hopes to give the world a better variety than has heretofore been possessed, there is an amount of satisfaction which so far exceeds that from dollars gained, that we cannot pass by the fact without a word of comment. We would not have men engage in fruit culture with the hope of thus becoming *rich*. The man who, with this spirit, enters the field, is pretty sure to fail, and as he retires he will give the cause a stab of anger, as undeserved as his motive was unworthy when he sought her favors. Some men will daily enjoy the choicest dishes of fruits, berries and vines, at a small expense of labor and attention to themselves, and then groan because the delicacies they have consumed have not also sold for enough to support the family. Let not such men suppose there is comfort in horticultural pursuits for them. It is only the industrious and persevering man of intelligence who derives much comfort or profit from fruit culture. The same great principles of success prevail here as in all other industrial pursuits. Labor, skillfully and continuously bestowed, with the blessing of GOD, alone gives true and enduring satisfaction, and complete success. The man who will thus cheerfully labor, and *wait* with patience, has a good hope of final reward.

We would not, by any means, throw a single discouraging circumstance in the way of one who would engage in this business. There is so much to encourage, and so many good and sound reasons why a man should succeed, that, on the whole, we desire to have the right kind of men take hold of it; but we would avoid those false ideas which lead

foolish men on to loss and discomfort, and, by giving the *obstacles* their due weight, enable all men to count the cost before starting upon the road, and thus being prepared, they will overcome them and succeed.

The facts which we shall rely upon are gathered from the experience of *successful* men, and are, of course, not to be used to excuse the failure of the negligent or the unskillful, because they are the results of skillful and industrious men, although far short of what the same men expect to realize hereafter.

Fruit culture may be said to be profitable in various senses. The amateur who pays a high price for a new sort of pear, and, after carefully tending it for a couple of years, is rewarded by finding that the sort is not adapted to his locality, and is utterly worthless for general cultivation, publishes the fact, and warns the whole community against it. He finds it profitable, because he thus saves the rest of mankind from loss. The man of wealth thinks it profitable to him to grow grapes under glass, at a cost of one dollar per pound, because he values the fruit so highly; and the lover of fine winter pears is satisfied to grow them at a cost of a quarter of a dollar each.

With all these men we have no controversy, and we agree with them that, to *them*, the results may be called profitable. But there is another, and the more common, use of the term, which is the sense in which we shall use it — the economic one. We propose to inquire whether fruit growing, in its general acceptation, offers so large returns in useful products for the table and the market as to make a more extended cultivation desirable, and also how the best results may be obtained with some of the most valuable of our common fruits.

The fruits most valued in Western New York, are apples, peaches, pears and grapes; and among small fruits, currants, strawberries and raspberries. Plums, cherries, apricots, quinces, gooseberries, blackberries and mulberries are less valued.

APPLES.

The apple is found to be our most useful fruit, and is generally considered the most profitable for extensive planting. The frequent occurrence of very valuable crops of apples, and the ready sale of all standard winter sorts for shipment to the sea-board cities, have led to considerable zeal in planting such varieties, and created quite a demand for reliable statistics upon the subject. In our own inquiries, we have found it next to impossible to procure accurate statements of the produce of orchards. It will easily be seen that there are good reasons for this, in the varying seasons, the effects of bad management, and the loss of all or a part of the crops from caterpillars, or years of unfruitfulness in kinds which do not bear annually, added to the fact that few farmers keep any distinct account with their orchards. The general impression of men is, that orchards of apples located upon soil of the best quality, and naturally well drained by underlying gravel or sandy, porous subsoils, are the most profitable parts of the farm, in proportion to the labor bestowed.

There is no question of the propriety and necessity of the farmer planting apples enough to supply abundantly his own table with the best of this fruit through the whole year; but further than this, we require to know whether a large extent of land may be usefully applied to raising apples for sale; and about what returns may be expected from such orchards, with good management; and what "good management" is.

There are some varieties, which, although possessing superior qualities for home use, and therefore necessary in the family orchard, are not saleable, and, of course, worthless for marketing. A fruit for *sale*, must at least be fair and good looking; it *ought* also to be of fine quality, to bring the best price; it must also be a sure and good bearer, and one that keeps long enough to insure carriage to market, and a reasonable period for selling. We find among all the sorts which are known to our nurserymen and orchardists, that there are few that have all these qualifications to such an extent that they can safely be recommended. A close inquiry will show that, in all mixed orchards, the *profit* has been derived from a very few sorts. Other kinds are found to yield some superior specimens, and to be well worth raising for one's own satisfaction, but, so far as money is concerned, the soil would be more profitably employed if planted with other crops.

Soil and situation fit for an apple orchard must always be valuable for other purposes; and as none but the best of lands can be depended upon, the value of such lands is consequently high. We are safe in assuming that land fit for such use, in Western New York, is worth, on an average, one hundred dollars per acre, the annual rent of which should be at least ten dollars per acre.

This is more than would generally be realized nett profit from the crops for some years after the planting of an orchard upon it; and at the end of ten years (at which time we might presume the trees to be in a bearing state), there would be a balance due from the orchard to the planter. After this time, the crops from the orchard should not be reckoned worth much, as the trees will occupy the whole soil with their roots, and the sun and air with their branches.

Ten years from planting, *Baldwin* and *Rhode Island Greening* apple trees can be relied upon to bear about three barrels per tree, each bearing year, which occurs each alternate year with the *Baldwin*, and generally so with the *Greening*. This gives us sixty barrels of fine winter apples per year, from trees planted two rods apart, or forty trees per acre. The whole annual expense of cultivation, and the gathering and barreling, will scarcely amount to twenty-five dollars, leaving the nett proceeds, if sold at one dollar per barrel, about thirty-five dollars per acre. This sum per acre will soon repay any balance due the planter, and the rapidly increasing produce of the trees, for many years, will satisfy any reasonable man of the expediency of planting large orchards, where the conditions of success are observed; but it will readily be seen that an orchard of any but the best varieties, will not pay interest and care.

It is important that the fruit grower should base his expectations entirely upon the results to be derived from a *series of years*, and not from any less period of time; otherwise he will be found wide from the truth.

Having given what may seem the latter part of our subject first, we proceed to show how these results may be obtained, with as great certainty as any other business operation can be carried out.

1. The Soil must be *naturally* underdrained thoroughly, and, if possible, of an open or porous nature, permitting the roots to descend readily to a considerable depth without encountering water. The beauty of the coloring, as well as the flavor and fair and handsome growth of the fruit, depend as much upon this as does the productiveness and durability of the tree. Cold or springy soils are inadmissable, and had better be used for some other purpose.

2. The Preparation of the Soil should be, thorough and deep plowing, and, if practicable, subsoiling on firm or clayey lands. If the land is not already rich, apply manure enough to produce a fine crop of Indian corn. Land which will grow fine corn, will be rich enough for trees.

3. Planting the Trees.—This may be done in April, as early as the ground can be plowed and prepared for a crop of potatoes or corn.

Potatoes, or, indeed, any hoed crop, will answer. Sown crops will generally destroy the young trees set the same season. The only care requisite in planting is to see that the trees are in good order — not having been exposed too much to the sun, wind or frost — and a proper balance maintained between the top and the roots, by cutting back the top in proportion to the loss of roots. Trees seldom die, if the after-culture is good. Do not plant deeper than they grew in the nursery, and see that the earth is firmly brought in contact with the roots.

4. After-culture.—This is the secret of success. All the previous steps may have been well taken; but if trees are neglected after plant-

ing, few will ever become valuable. From the time the young trees are set until they are fully established in bearing, a constant state of mellow, worked soil should be maintained, by the cultivation of the various hoed crops, vines, &c.—never allowing the orchard to be

seeded down, except in case of over rampant growth, which tends to promote unfruitfulness. In cases like this, an orchard may remain in

grass a year, to check the growth of wood, and induce the formation of fruit-buds. Ten years may seem, to many, a long time to plow, hoe and care for a young orchard; but the results justify the labor, and the land can be made as productive, during most of the time, in hoed crops, as in sown ones.

5. PRUNING should be done very moderately, and principally with reference to forming well balanced and not too dense heads to the trees. If done in early spring, it promotes the growth of the limbs which are left; but if done soon after the trees commence to start, pruning has a powerful effect to check and disturb the growth of trees. Sometimes this is done to promote fruitfulness, but is scarcely safe practice for orchardists. Some care will be required to see that the main branches of the trees are so disposed as to form a regular head, and not become so dense as to render the fruit in the inside of the tree green and insipid. Some *varieties* will require more attention than others upon this point.

If we review what has been said, we shall see that, although apple growing does not offer great immediate returns, nor enormous profits, still there is great inducement to plant; and there are few farms in our best agricultural counties where sufficient land, of the right quality, and conveniently located, cannot be found, upon which to have a young orchard coming on, to fill up the deficiencies made by age and disease in the old orchards, and also to fill up several deficiencies caused by short crops, in the pocket of that farmer who wisely selects, and carefully cultivates his trees, until his surplus apples sell for enough to satisfy him that they are worth the best care he knows how to bestow upon them.

Land which is located so near our larger towns and cities as to be worth two or three hundred dollars per acre, and upon which large quantities of manure can annually be hauled from the cities to facilitate the raising of such articles as fruit trees, seeds, vegetables, berries and similar products, from which large returns are expected under such expensive management, cannot, perhaps, be expected to pay in apple orchards; but the best conditions of success are found in all our townships, without any necessity for paying over one hundred dollars per acre for the soil.

We have found so great a difference of opinion among cultivators as to the value of different sorts of apples for marketing, that we cannot venture to give a list for "general cultivation." Such a list is an impracticability, so far as our present subject is concerned. Men who engage largely in this branch of industry, will, of course, consult the market they expect to sell in, and the success of the varieties they are to plant in the locality they are to plant in. But we give below the names of a few pretty reliable apples for planting in Western New York, where the object of the planter is simply profitable apples for sale:

SUMMER APPLES.—*Red Astrachan, Golden Sweet.*

FALL APPLES.—*Fall Pippin, Porter, Twenty Ounce Apple.*

WINTER APPLES.—*Baldwin, Rhode Island Greening, Talman's Sweet, Tompkins County King, Roxbury Russett, Northern Spy.*

PEACHES.

The climate and soil of Western New York seem naturally adapted to the health, longevity and fruitfulness of the peach. Here we frequently find trees planted by the early settlers, now thirty or more years old; and although these specimens are becoming rare, and the orchardist now does not look for such long-lived trees, still the fact shows how well this locality is adapted to their culture. Disease is also comparatively unknown, and a case of the "yellows" is scarcely ever heard of. Indeed, few of our orchardists know there is such an enemy to the peach.

The great ease with which this fruit can be grown has led to much slovenly management, and sometimes to so great a reduction of the price as to make the profit very small, and the encouragement to plant new orchards very slight. Nevertheless, there must always be a great sale for good peaches, and the culture of fine varieties cannot often fail to be abundantly profitable.

The peach is not naturally a long-lived tree, and although, under favorable circumstances, it will continue in bearing fifteen or twenty years, it is not well to depend upon any such longevity. We shall, therefore, base our advice upon the common practice and opinion that it is best to make new plantations every few years, and remove the old trees to make room for other crops as fast they become feeble and the fruit inferior. We see no good reason why the trees should not be cut down and removed as often as it becomes advantageous to the fruit grower to do so.

To make peach growing *profitable*, a suitable soil is indispensable. It should be warm, rather sandy, and quite dry. No water near the roots of a peach tree is admissable. A *very* sandy soil is usually too poor to grow fine-sized or well-flavored fruit, but a moderately rich loam, with a good proportion of sand, is best. Very light lands fail to perfect the great crops which are commonly found upon trees planted there; liberal manuring generally secures a crop, even there.

Having plowed the land intended for the orchard, set the trees at the distance of twenty feet each way (twenty-four is not too far for large-growing varieties). Plant in April or first of May, using great care in preserving the roots from sun or wind during the time the trees are out of the ground. If one year old trees are planted, cut back all the young shoots nearly to the main stem, and head down the main stem to about four feet. Keep the soil mellow about the trees all the summer following, and plant some hoed crop to pay for the use of the land.

The growth of the trees will now be very rapid, and, with good care, they will be in bearing condition on the fourth summer after planting. From this time forward the crops should be large, and increase in quantity for three or four years. Crops of corn, potatoes, beans, or other hoed crops, may be raised among the trees until they come into bearing — after which no crops should be taken off the

ground, but a fine, mellow surface kept by plowing and using the cultivator often enough to keep all weeds down. A crop of peaches, if worth raising at all, is worth giving all the soil to, as we do for any other crop. It is strange that so many persons sow their bearing orchards with wheat, oats or peas, apparently expecting to reap a double harvest — one from the trees, and another from the soil beneath them, which is taxed pretty severely by the roots of the peach trees, which penetrate every part. The result of such cropping is a poor crop of peaches, and the crop beneath them amounts to little or nothing, because of the shade and drain upon the soil by the trees. A man would be considered silly who sowed oats among his hills of corn, expecting to secure a crop of both; but that is no more a violation of the natural laws of vegetation, and the demand of all plants for a supply of moisture, manure and sunlight, than it is to plant a crop of oats among peach trees, set at a distance of twenty feet apart, and which have had three years' growth.

One considerable obstacle to the cultivation of peaches is the "curled leaf," which strips the trees of a large share of the leaves first put out, and frequently affects the trees so severely that a large share of the fruit falls along with the leaves — the trees are severely affected, and, in the case of some varieties, become permanently injured by this means. The cause of this disease is unknown, and no remedy has been found; but we ascertain that it affects some varieties more severely than others, and consider it an important consideration in the selection of varieties for the orchardist.

Every good cultivator of peach trees will see that his trees are carefully examined once or twice each spring and summer, and cleared of all grubs which attack the tree at the surface of the ground. If these insects are left undisturbed, they will destroy many trees and injure others. A man with a hoe to clear away the earth, and a strong, sharp-pointed knife to dig out and kill all the grubs, will effectually purify a large number of trees in a single day.

The "yellows" can scarcely be said to do us any harm; but it behooves our cultivators to watch for and exterminate diseased trees immediately, planting only such as they have good reason to believe are entirely sound.

Pruning.—Whatever may be the ultimate result of the advice now frequently given by writers on pruning, we are doubtful of the utility of any of the plans recommended. The price of peaches, the value of the lands occupied, and the perishable nature of the tree, all combine to satisfy us that plans which require much labor must be given up as unprofitable. The fruit must, and can, be raised at a moderate expense; and five good crops, secured at a small expense, and then a new orchard coming on to take the old one's place, pays better than ten crops upon which twice the labor has been expended. We would not deter any man from as careful pruning and patient experiment as he chooses to make; but we would advise caution in practicing extensively any system of pruning severely, until he has demonstrated its

advantage upon a moderate scale. The only pruning we recommend is clearing out dead wood and shortening back branches which disturb the proper balance of the head — depending upon high culture for an abundance of young wood.

Specimen of a Properly Pruned Peach Tree.

The produce of peach orchards, like all other fruit plantations, varies so considerably that we are in great danger of misleading ourselves by estimates. We shall, however, show something near what may be expected from this branch of fruit culture.

One acre of land, planted at the distance of twenty feet apart each way, will require one hundred and ten trees.

The hoed crops from the land will pay expense of raising and care of trees for three years.

The fourth year the trees should produce one basket of peaches to each tree, or one hundred and ten baskets.

The average price is, say, seventy-five cents per basket, equal to eighty-two dollars and fifty cents per acre. This will pay cost of keeping in good order, picking, and a fair return to the planter for land, risk, &c.

The crops for four or five years thereafter will average about two baskets from each vigorous tree, of the best market sorts; after which the crop will diminish until it reaches a point where it becomes unprofitable to remain longer in orchard.

During seasons of great productiveness the price will fall below our figures, but the crop will rise above in amount, which serves to equalize the amount realized in money. Taking a large number of plantations together, and for a series of years, we doubt whether the annual average product of peaches has exceeded one dollar per tree, or one hundred and ten dollars per acre — an amount which, although it justifies the planting of suitable lands to a large extent, where such lands are not very high priced, is still so low that few men would consider it a great speculation to engage in growing peaches. We shall hope to see the planting of peach orchards go on, and have no doubt about their value and profitableness, when properly managed; but if any man supposes that he can make "a fortune in five years" by growing peaches, we have only to say, try it, and the law of labor shall meet you and satisfy you that toil is necessary, even in this branch of fruit culture.

It is not practicable to give a list of sorts for "general cultivation," which would be found profitable in all the various sections of our country where peaches are raised. We must rely upon the good sense and experience of the planter to carry out the general principles elucidated, and make such a selection of varieties as his own observation

has shown him to be best for his particular locality and market. We give a few names which are found good in Western New York:

Early York (serrated leaf).—This variety is the earliest which has proved profitable. Although not the sweetest of peaches, it is fine flavored, juicy and good. The tree is hardy, productive, vigorous and long lived.

Crawford's Early.—Of all our varieties, this is the most abundantly productive; very handsome, and when not allowed to overbear, is good; sells readily, and is, on the whole, one of the best for the peach grower.

Large Early York.—This may be taken as the name by which to designate a class of the finest of all peaches, but none of which prove so desirable to the raiser as to the consumer. They are usually moderate bearers, and have only their beauty and quality to commend them to orchardists.

Old Mixon Freestone.—Has long been known and admired by peach raisers. It ripens immediately after *Large Early York.* The fruit is fine, handsome and good flavored; bears carriage admirably, and commands a good price. The trees are very hardy, vigorous, productive and long lived.

Old Mixon Cling.—Among the class of clingstones, this stands first for beauty, quality and productiveness. It should be ripened in the house, and then becomes one of the finest of peaches.

Crawford's Late.—Is very saleable, and commonly pays pretty well, although not a great bearer nor very hardy. It is very large.

Red Cheek Melocoton.—Although not so large as *Crawford's Late*, is equal to it in value, because more productive and higher colored.

Langworthy's Late Rare-ripe.—This peach is very profitable in long seasons, and when the trees do not suffer too much from curled leaf. It resembles the *Large Early York* in appearance and quality, but ripens about the season of the *Red Cheek Melocoton.*

The best results in raising peaches for sale, are obtained from orchards where a few of the best and hardiest productive varieties are planted in such proportions as to give a supply of early, medium and late fruits. A single variety will sometimes fail of a crop; and the orchardist who can supply dealers through the season, stands the best chance of a sale to good and responsible purchasers. To secure these few best sorts, is, therefore, an item of the utmost consequence to the planter. We have known a man, on seeing a basket of very splendid peaches in market, hurry off and buy, for planting, a lot of young trees of that variety, without ascertaining that the trees which bore the splendid fruit were so very unproductive that one basket could not be gathered without collecting the whole fruit of six trees. The fruit was fine, but, to the orchardist, quite worthless.

Orchardists are sometimes blamed for planting only the most productive and handsome sorts of peaches, without regard to quality; but we cannot blame a man for not raising a superior flavored peach, when he cannot obtain enough more for it to make it equally profitable to

him. The law of love requires us to "love our neighbor as ourselves," but not *better* than ourselves. Therefore, when we find purchasers willing to pay an extra price for fine flavored peaches which are unproductive, it will be time to advise planters to grow them. Orchardists will grow the best when they are equally profitable, and not before.

PEARS.

The interest, which is now becoming general, in the culture of the finest varieties of pears, has lead to much inquiry as to the practicability of entering into their culture upon an extensive scale, as a source of permanent and reliable income. The high prices obtained for all fine samples of pears known to be of the best quality, and the productiveness of several of our best market varieties, naturally make such inquiries frequent and pertinent. The subject is somewhat embarrassed with difficulties, risks, and want of reliable facts; but we shall endeavor to treat it in such a manner as to show what is, and what is not, to be expected from such an undertaking, assuring our readers that we greatly desire to see some patient and intelligent men enter into it.

Pear trees are generally found to succeed best upon rather stiff soils, but any rich, strong, loamy soil, with a dry subsoil, will, under good management, grow good pears in the western part of this State. The trees are generally vigorous, and grow rapidly if carefully cultivated, even when not highly manured, but moderate manuring greatly facilitates their progress. Soil prepared as we have directed for apples will commonly be good enough, and, in some cases, pears on pear stocks will thrive upon land which is too hard and stony to give good crops of apples, the trees being naturally better adapted to a clayey subsoil than the apple is.

The trees may be set twenty feet apart, as they do not usually grow to as great size as apple trees, and are more upright in their habit of growth. There is, however, considerable difference in the size of the trees of different sorts, some — as the *Flemish Beauty*, for instance — requiring twenty-five or thirty feet to attain a full development.

The process of transplanting has been so often described that we need not repeat it here. It does not differ in any essential point from that required for apples and other hardy fruit trees. The after-culture, also, is to be similar and equally good, no sown crops being allowed for several years, and then only as a means of bringing some rampant growers into bearing, or for restoring to the soil that mellowness and fertility which seem to be best secured by plowing in a turf or clover crop.

The success of the pear grower will depend, perhaps, as much upon the varieties planted, as upon any other item. Among pears, as well as apples, there are but few of the many sorts offered for sale in the nurseries that will be profitable for sale. Dependence must be placed on those well-proved varieties, ripening at such seasons as will make

it practicable to market the produce. We do not think there are more than six sorts that we would be willing to recommend for standard orchard planting.

Skill and experience will do a good deal to enhance the value of the crop of pears, by gathering at the right time, and using the proper means to ripen off the fruit.

Summer pears should be gathered when the fruit is fully grown, and the wormy and premature specimens are found to be ripe upon the tree. Place the fruit in shallow drawers or boxes, and cover them with cotton cloth, or paper, to keep out the light and preserve the moisture of the fruit, so that no shriveling shall take place. Ten days or two weeks is as long as the early pears should be in perfecting by this process; but some varieties, like the *Bartlett*, will ripen when but half grown.

The later pears require about the same treatment, except that longer time is required to mature them.

Pears should be kept in a dry and moderately cool room until the late or winter sorts are gathered. These should be packed tightly in boxes or barrels and put in the cellar, in the same manner as practiced with apples. They may remain there until required for use, and then kept for a few days in a warm room, if necessary, to fully ripen them.

An orchard of standard pear trees, two or three years old from the bud (which is about the best size for transplanting, under ordinary circumstances and treatment), can be set out for fifty cents per tree, all told — the cost of trees, planting, &c. At twenty feet apart, we have one hundred and ten trees per acre, costing fifty-five dollars. If these are *Bartletts*, they will produce an average of one-eighth of a bushel at the fifth year from planting. This, at four dollars per bushel, is the original cost, now returned; and the trees will bear annually and increasingly, until, ten years from planting, one bushel per tree may with certainty be expected, equal to four hundred and forty dollars per acre, annually. There are no other sorts which commence to bear quite so early as the *Bartlett*, but several will be found equally productive at ten years from planting.

The following are good and reliable pears for orcharding in this region. There may be some more equally good, but we do not feel as if any others are proved so: *Bartlett*, *Flemish Beauty*, *Sheldon*, *White Doyenne*, and *Lawrence*.

We have said nothing of any drawbacks upon the cultivation of pears, and, indeed, there are but few — but those few are serious.

1. The *fire-blight* is the great and principal enemy we have. Sometimes this disease destroys whole plantations of pear trees; and no man need expect to see ten years pass over his pear orchards without having cases of this disease to deal with. We do not know what percentage should be allowed as risk from this pestilence, but, in our own planting, we say one tree per year in each one hundred, or ten per cent. in ten years. Nothing certain, however, can be calculated; and it is among the risks of the planter that he may lose one-half or all his

trees before ten years roll by. We think the profits bear a very fair proportion to the risks, and mean to continue planting. The only remedy we know for blight, is to cut instantly all the limb or limbs affected by the disease entirely off, below all signs of blight. If done promptly, this generally saves.

2. The cracking, and the discoloration of the fruit by black blotches, which contract the fruit and destroy its value. We know of no remedy for these diseases, but to plant upon a dry subsoil, and cultivate the trees liberally, manuring if the trees do not keep up a vigorous growth. The difficulty is principally confined to some varieties, and forms one of the chief difficulties in making a selection for the orchard.

DWARF PEAR TREES.

There is a very common opinion that dwarf pear trees — however interesting and satisfactory they may be to the amateur who cares little how much his pears cost him, so that he gets them soon, and in a shape that gives him temporary pleasure — are of little or no value in an economical point of view, and that they are *not profitable* for planting, in the sense in which we are using the word in these remarks. This opinion, if founded upon the results to be derived from planting indiscriminately all the sorts known to rank as "best" on the catalogues of nurserymen and the lists of Pomological Societies, is quite correct; but it is far from true, when applied to a few sorts which are adapted to the dwarf system, and cultivated with care and intelligence.

We will use the *Louise Bonne de Jersey* as an instance to show how dwarf pears may be made to *pay* any man of common sense and industry for all his labor and care, merely remarking that, although few, if any, other varieties will give as good results, still we are not without a fair assortment of early, medium and late varieties which approximate quite nearly to the same good measure, and may confidently be expected to give great returns.

Louise Bonne de Jersey pear trees budded upon quince stocks, two years from the bud, and which have been properly pruned, so as to give good form for future pruning in the pyramidal shape, can be purchased in this market for twenty-five dollars per one hundred trees.

One acre planted with trees ten feet apart each way, will require 430 trees, at 25 cents per tree	$107.50
The cost of preparing the soil and planting, say	42.50
	$150.00

The land will yield crops enough of small fruits, vines, beans, potatoes, &c., to pay cost of keeping all in high cultivation for two or three years.

The third and fourth years the trees will produce fruit enough to pay all expense of cultivation.

The fifth or sixth year from planting, these trees will produce one-eighth of a bushel each, or fifty-three and three-fourths bushels per

acre. The value of such pears in our market varies from two dollars to four dollars per bushel. At the lowest price, the produce of one acre is one hundred and seven dollars and fifty cents.

From this time forward the crop will increase rapidly, and, at eight or ten years, may be set down at an average of one bushel per tree per annum, equal to four hundred and thirty bushels (or, at two dollars per bushel, eight hundred and sixty dollars) per acre per annum.

The labor required will be considerable, and the work of pruning, gathering, ripening and marketing must all be well done; but, after all expenses are paid, there will be a handsome return to the planter, and a degree of satisfaction secured which can be found in few employments.

The soil for such a plantation may be of good, strong loam; if inclining to clay, it is perhaps best; but any good, rich, loamy soil, with a natural and perfect underdrainage, which is not too sandy, will answer the purpose. Very hot, sandy lands are not good for the quince stock upon which the trees are worked.

The soil is to be prepared, as recommended for other orcharding, by very deep plowing; but more manure should be applied and incorporated with the soil than is necessary for apple or standard pear trees.

PLANTING is done in the same manner as practiced for apple trees.

PRUNING.—The principal and distinctive feature of dwarf trees is in the pruning. We give a cut, showing better than we can describe, how this operation is begun and carried forward. The pear tree, one year from the bud, is cut back to A (fig. 1), or, if slender, to B, and if it is desirable to produce very low branched trees, to C. This causes the buds below to break and grow, forming a tree in the autumn such as is represented in fig. 2. This is the tree commonly sold by nurserymen, and here commences the operations of the orchardist. The tree (fig. 2), when planted, is to be cut back, as represented by the cross lines, again causing the lower buds upon each shoot to break and form a compact, branching tree, of pyramidal form.

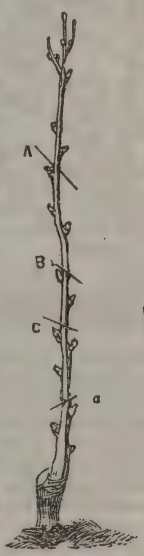
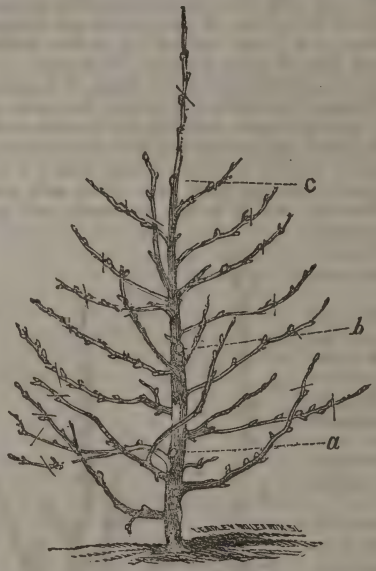


Fig. 1.

Fig. 2.

Each season thereafter, the same course of cutting back one-half or

more of the first year's growth from all the main branches, and from the leading shoot, is to be pursued. The pruning should be done in March or April, before the buds start.



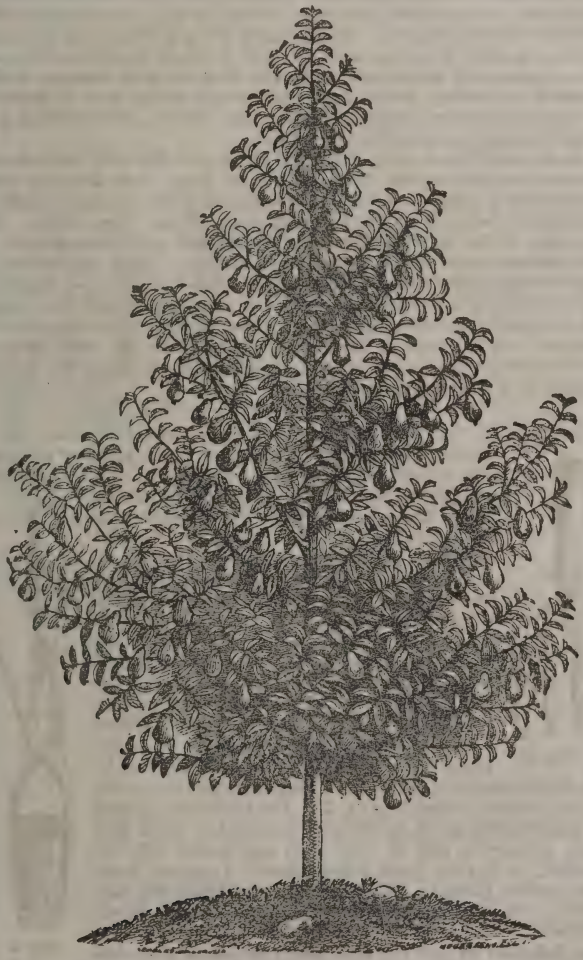
At the end of four years from budding, we shall have a tree as represented in the annexed cut. The letters *a*, *b* and *c* show where the trees have been cut back each year.

Pursuing this system of annual pruning, we shall have, at the end of ten years, a tree similar to the one of which we have taken a copy (see opposite page), and which has for some years borne annually about a bushel of superior specimens of *Louise Bonne de Jersey* pears.

Nothing can be more productive or beautiful than such trees; and we are convinced, from daily observation and experience, that only a right understanding of the necessary steps is required to make all our fruit lovers desire to plant dwarf pears. Much has been said for and against them; but, so far as we have read, the opponents of these trees have directed their blows against them when grown under circumstances in which their advocates declare they cannot be expected to flourish. Let those who doubt try a *few* before planting extensively.

It is among the advantages of dwarf trees, that the fruits are from one-fourth to one-half larger than when grown upon standards. The greatly increased price of such specimens, when carefully marketed, will more than compensate for any extra care the trees require, and for the annual manuring which should be given when planted upon only moderately rich soil.

There are many varieties which do not grow well upon the quince, and some which are desirable to the amateur; but there are few which will make profitable trees to the orchardist. We give the names of a few of the best: *Osband's Summer*, *Bartlett*, *Brandywine*, *White Doyenne*, *Louise Bonne de Jersey*, *Duchesse d'Angouleme*, *Beurre Diel*, *Glout Morceau*, *Vicar of Winkfield*, *Beurre Langelier*, and *Easter Beurre*.



Louise Bonne de Jersey Pear Tree, Ten Years from the Bud.

It has been asserted that dwarf trees are less liable to fire blight than standards; but we have not found this to be so — we do not find much difference in this respect. But we soon get pay for all our investment in dwarfs, and, of course, have the risk of blight to run on a less number of years. If an orchard of dwarfs lives but five years we shall be justified in planting, which we would not be in the case of standards. We have, however, every confidence that twenty, or even forty years, is not beyond a reasonable expectation.

As we have before said, few or no other varieties will yield as many bushels per acre as the *Louise Bonne de Jersey;* but there are several which bear a higher price in the market, and the produce would undoubdtedly bring as much if sold in some of our large cities. There are, also, so few reliable facts to be ascertained upon this subject, that our estimate must not be looked upon as one of sure application, but only an approximation to the real facts, based more upon the results derived from a few dozens and fifties of trees, but which have been so far reduced below actual results, in some cases, as to be comparatively reliable. In the case of dwarf pears, as well as all other fruits, we must calculate upon the general results, and not from the failure or success of a single planting.

IMPLEMENTS FOR TRANSPLANTING VEGETABLES. — In removing any young plants from the seed-bed to the nursery plantation, the ground should be well watered, if dry; and instead of pulling up the tender plants, as is usually done, the ground should be loosened with a transplanting fork, similar to the one shown in the accompanying cut (fig. 1). It is also of great use in facilitating their removal from the nursery bed to their final place of planting.

Fig. 1.

In transplanting large plants from the nursery rows, it is very desirable to have a ball of earth around their roots, and for this purpose a semi-circle trowel will be found useful, if not indispensable. Where a large number of plants are to be transplanted, the operation may be facilitated by the employment of some such an instrument as figured in the annexed engraving (fig. 2). The blades are opened by pressing the lever, *a*, towards the handle, when they open outwards, and in this state are thrust into the ground, having the plant within them; a counter pressure causes them to collapse, and to embrace the ball firmly, and in this state, the transplanter being drawn upwards, brings with it the plant and ball entire. It is then taken to its new site and set in its place, when the lever, *a*, is again pressed inwards, and the blades open and are withdrawn.

Fig. 2.

BIRDS

BOTH USEFUL AND INJURIOUS TO THE FARMER AND HORTICULTURIST.

WRITTEN FOR THE RURAL ANNUAL BY C. N. BEMENT.

INTRODUCTORY.

NOTWITHSTANDING much has been said and written in regard to the destruction of the feathered tribe, it may not be out of place to renew it occasionally in the hearing of those who are prone to destroy these harmless and musical little warblers. Did every one love birds as well as we do — did every one delight in hearing their merry and gladsome notes — few, very few, would be the birds destroyed on the farmer's premises. But cruel as it is to take the life of the innocent birds, that build their nests and rear their young among the shrubbery, around our meadows and groves, even under our very windows, and in our porch, we have, in days gone by, we are sorry to say, been guilty of such acts of cruelty. Gladly would we, if we could, restore to life every innocent bird we have been guilty of destroying; but it is now too late.

For mere *sport*, multitudes of the feathered tribe are destroyed by wanton boys and the gun of the fowler. For having been guilty of such acts, we almost think we can excuse ourself. Like other boys, we were fond of *sport*, notwithstanding such sport resulted in the death of those creatures that had an undoubted right to live. We can call to mind many times when we have been well nigh affected to tears, in witnessing the death-struggles of the little warblers that have fallen at our feet, pierced with leaden missiles. Often, too, have we called to mind what L'ESTRANGE, in his Fables, says in regard to the observation made by some frogs to some frolicsome boys — "Children, you do not consider that though this may be sport to you, it is death to us."

It is our intention, in this little essay, to present to the notice of the farmer, gardener and fruit-culturist, some of the habits and characteristics of our birds most useful as well as injurious, and interesting to them.

It could not but have been noticed by the most casual observer, that

the various tribes of insects have *increased* in a geometrical proportion to the *decrease* of birds, who are their natural enemies; the equilibrium of nature has been disturbed by our cruelty and ignorance in refusing protection and succor to our best friends, and the annual loss sustained by it to the country it would not be possible to estimate. The wheat, corn, vegetables, fruit and fruit trees, furnish conclusive testimony of the great disturbance in the equilibrium of nature, produced by those ignorant savages who can load and shoot.

Should we, in calling attention to this subject, be the means of preserving and protecting the birds that sing about our dwellings, we shall feel that our time has been well spent, and that we have not labored in vain.

C. N. BEMENT.

Springside, near Poughkeepsie, N. Y. 1857.

INSECTIVEROUS BIRDS — THEIR USEFULNESS, &c.

It takes mankind a long time to learn the ways of Providence, and to understand that things are better contrived for him than he can contrive for himself.

It is a well-known fact, and could not escape the notice of the most casual observer, that the alarming increase of insects and worms in making ravages upon our fruit trees and fruit, not only paralyzes the efforts and disheartens the hopes of the cultivator, but threatens destruction to many of the most delicious kinds. There are various insects that always threaten the destruction of fruits and fruit trees, and they seem to be increasing. So extensive are their ravages, they already render very uncertain many kinds of fruit. But very few of our apricots and plums we ripen without premature decay, from the worms generated by the beetles which surround our trees in the twilight of the evening, in great numbers, when the fruit is quite young. And when the produce of our apple, pear or peach trees is small, but few of these escape the same fate. How shall they be kept at bay? We will answer. The natural enemies of insects are birds. Insects are the food of birds. They grow on every tree, shrub, plant — in every pool, swamp, soil. They swarm in the air, nestle in the flowers, revel in the dirt. Everywhere they come into being in teeming millions. Many of them attack the fruit for food, or for nests for their larvæ. The means provided to prevent their doing evil are the birds. Naturally, every grove, field, swamp, hill and vale are alive with birds of various sizes and characteristics, adapted to the varieties of the insect world. They live chiefly upon insects. Hence, before man destroys the birds, the trees and their fruit are never much injured by insects. God provides a balance between insects and the feathered tribe; but man, in his cruelty and impiety, destroys the balance, and the insects creep upon his fruit to pay him for it. It is only after civilization has

destroyed the birds of a country, that insects overrun it. And it is quite doubtful whether all the ingenuity of man can supply the want of birds.

Our natural remedy, then, for the fruit, is the birds. We should, therefore, encourage them to grow and multiply in all our fields, gardens and orchards. We should not alarm or destroy them. We should hold them as the naturally commissioned sentinels of our fruit trees. We should regard them as natural ornaments and conservators of our orchards and gardens. We should feel that the birds of a country are its standing army, self-marshaled and trained to meet and overpower the invading armies of the insect world. The intentional destruction of a bird should be considered a public loss, and should be held an outrage upon the divine order and human interest. All agriculturists, fruit growers, gardeners, philanthropists, all good people, should discountenance the destruction of birds, and encourage their multiplication by the kindest treatment. It should become the settled conviction of every community, that birds, by holding in check the insect scourges, are benefactors.

Of late, the people are beginning to learn that they have mistaken the character of most of the little birds, and have not understood the object of the Almighty in creating them. They are looked upon as the friends, and very great friends too, of the gardener and fruit-culturist. It has been seen that they live mostly on insects, which are the worst enemies of the horticulturist; and if they take now and then a cherry, they levy but a small tax for the immense service rendered.

In vain will be our labor and toil, in vain the united efforts of Horticultural Societies for increasing and perfecting the cultivation of the most delicious varieties of fruits, unless we can *increase*, or at least cease to diminish, these useful and melodious birds.

In addition to the important usefulness of these birds, their musical notes in the twilight of the morning are peculiarly delightful, awakening us to the sublime contemplation and enjoyment of all the infinite beauties of creation.

So greatly has the stock of birds been reduced, that fruit growers and cultivators are beginning to be alarmed, and, in some of the States, they have already secured legislative protection.

In England, says a writer, there is scarcely a farm without its rookery; the humid atmosphere multiplies every species of insect, and those birds reward man for his forbearance by ridding him of legions of his foes. By a policy like that which dictated the revocation of the edict of Nantes, they have occasionally been exposed to the mischievous propensities of recreant, unruly boys and loafers, who, as far as utility is concerned, are not to be compared to crows; but the error of this step soon became manifest, and they are now received with universal welcome.

In Japan, the birds are regarded as sacred, and never, under any pretence, are they permitted to be destroyed. We are informed that, during the stay of Commodore PERRY's expedition at Japan, a number

of the officers started on a gunning excursion. No sooner did the natives observe the cruel slaughter of their favorites, than a number of them waited upon the Commodore, and remonstrated against the conduct of the officers. There was no more bird-shooting after that; and when the treaty between the two countries was concluded, one express condition of it was that the birds should always be protected. What a commentary upon the inhuman practice of our shooting gentry, who are as eager in the pursuit of a Chick-a-dee as of an Eagle, and indiscriminately shoot everything in the form of a bird which has the misfortune to come within reach of their murderous weapons.

We have ever been a lover of birds — the denizens of the air. They have ever appeared to us almost too fair and pure for this groveling, sensual world. In our boyhood, we were taught that it was wrong to harm some kind of birds; but there was a class that were proscribed as doing injury to man (while they were innocently engaged seeking their daily food), and he that killed the most of them was the best fellow. For many years past we have supposed that the birds were rapidly decreasing, for their numbers in our fields and groves were few.

We have had some little experience as a farmer, and whether it is because we are friendly to the birds, or for some other reason, we can say that our corn fields have never been ravaged by the lesser birds, nor "pulled up by the crows." We shared our cherries hitherto very cheerily with the birds, because they helped protect them while maturing.

We think that more interest might properly be felt in undomesticated birds which frequent the farmer's premises. We would, of course, give no protection to the very few, which, by their depredations, have proved themselves unworthy of it. We do not, at present, recollect of but a single instance of this sort — and that is the Cedar, or Cherry-bird. And it is somewhat doubtful whether he does not more than compensate for the fruit he eats, by the destruction of insects. Hawks and Owls are fine fellows, in comparison. The social Robin, that builds its nest in the summer-house, or under the eves of the wood-shed; the twittering Swallow, animating the warm side of the barn with its soft and lively chatter; or even the little Sparrow, snapping up crumbs at the kitchen door; all add to the interest of a country home. In many places, the Wren has become numerous in the vicinity of dwellings, where suitable accommodations have been found. Wilson relates that a mower having hung up his coat in summer under a shed, found, a few days afterwards, when he had occasion to put it on again, that a pair of Wrens had appropriated one of his pockets, and had nearly completed a nest in it. They followed him and scolded him with great vehemence at this sudden assault on their arrangements, and the complete ruin of their household economy.

We will now endeavor to show the usefulness of birds, by their mode of living — their great benefit to the farmer, gardener and fruit-culturist, in the destruction of vast numbers of noxious insects — the folly and cruelty of destroying them. We will also endeavor to impress

upon all cultivators of the soil the importance of putting an immediate stop to the shooting of birds on their premises, by motives of humanity, if nothing else.

If farmers and gardeners were more fully aware how much they were indebted to birds, they would take all possible care to protect them from injury, and would encourage them in building nests and rearing their young about their fields, orchards and gardens, instead of shooting them because they eat the berries and other fruits. If these persons would observe and inquire more deeply into the matter, they would become convinced that these very birds, which they are disposed to shoot as nuisances, cleanse their trees from slugs, canker-worms, and other insects, which, if but let alone, would soon destroy the tree itself. And the cultivator may be well content to pay the yearly tribute of a few cherries to the guardians of his trees. Our natural remedy for the fruit, then, is the birds.

It is admitted by those who have paid attention to the habits of birds, that, on the whole, they are a benefit rather than an evil, in a pecuniary point of view, by destroying multitudes of insects and reptiles, which do so much damage to our vegetation. Besides, we consider that their music around our dwellings is ample compensation for the few cherries that we are willing cheerfully to divide with them.

There are some of our most familiar little birds of which we may here say a word. Every one must have seen the little AMERICAN GOLDFINCH (better known by the name of Yellow-bird) on the thistle by the roadside, and wondered, perhaps, that his taste should lead him to so strong a luxury; but he is all this while engaged in devouring the seeds of this pest, which, but for him, would in a measure overrun the grounds of every farmer.

American Goldfinch, or Yellow-bird.

These familiar, well known and favorite little songsters generally make their appearance in April. During the latter part of summer, they are almost constant visitants in our gardens, in search of seeds, which they dislodge from the husk with great address, while hanging, frequently, head downwards, in the manner of the Chick-a-dee. From these circumstances, as well as from their color, they are generally known, and pass by various names expressive of their food, color, &c., such as Thistle-bird, Lettuce-bird, Sallad-bird, Hemp-bird, Yellow-bird, &c.

The seeds of the lettuce, thistle, millet, yellow-seed, etc., are their favorite food; and it is pleasant to observe a few of them at work in a calm day, detaching the thistle down in search of the seeds, making it fly in clouds around them.

SWALLOWS and MARTINS, that find congenial society in man, should be encouraged to take up their abode around our dwellings, for they

live upon flies, wasps, beetles and small insects, which, in their larvæ or grub state, are the pests of the garden. Yet, what fair game are their ingenious nests considered by the destructive, wanton school-boy. Moths and millers are the common prey of all; even the poor Bat, which at twilight flits about on rapid wing, is a destroyer of the common enemies of vegetation. It has been estimated that a single Martin will devour five thousand moths and other insects in a week.

The PURPLE MARTIN is the largest of the family of American species. It reaches this State from the South about the middle of April. They are bold and active, attacking and pursuing all the larger birds who venture to approach their nests. They are, consequently, general favorites, and boxes or fancy houses are usually prepared for them against the gables or on the tops of dwelling houses. They leave us about the middle of August, on their Southern migration. They are peculiar to America. They feed upon various winged insects, such as wasps, bees and large beetles.

The Purple Martin.

The genus *Hirundo*, which embraces most of the Swallows, is a very numerous tribe. The Swallow has a peculiar, twittering voice, flies with extreme rapidity, scarcely ever walks, and performs all its functions while on the wing, or sitting. Its plumage is glossed with a rich purple.

To the Martins and other small birds, the Swallow announces the approach of birds of prey. By a shrill, alarming note, he summons around him all his species and the Martins, as soon as an Owl or Hawk appears. The whole band then pursue and strike their enemy, till they expel him from the place — darting down on his back, and rising in a perpendicular line, with perfect security. They also strike at cats while they are climbing the roofs of houses.

Early in the spring, when the solar beams begin to arouse the insect tribes from their annual state of torpidity, the Swallow is seen returning from its long migrations beyond the ocean; and in proportion as the weather grows warmer, and its insect supply increases, it gathers strength and activity. The Swallow ought to be cherished, as the bird is of infinite service to mankind, by destroying myriads of vermin which would prove fatally prejudicial to the labors of the husbandman.

The BARN SWALLOW is one of our most common visitors. It makes its nest of pellets of mud mixed with grass, and attached to the rafters

or eves of our barns. It destroys numerous noxious winged insects. It leaves this State about the end of August. It is peculiar to America, but confounded with an European species.

Early in May the Swallow begins to build, and it takes nearly a week to complete the nest. It is in the form of an inverted cone, and placed up against a rafter in a barn. It is not uncommon for twenty or thirty pair to build in the same barn, and some nests are within a few inches of each other; yet most perfect harmony prevails in the most peaceful and affectionate community. When the young are able to leave the nest, the old ones entice them out by fluttering backward and forward, twittering and calling to them constantly. As soon as they leave the barn, they are conducted to the trees and fences, or bushes by the pond or shore, where their proper food is abundant.

The Barn Swallow.

In August they all prepare for departure. They assemble on the roofs in great numbers, dressing and arranging their plumage, and making occasional essays, twittering with great cheerfulness. Their song is a sprightly warble, sometimes continued for a considerable time. Then they pass along in great numbers; sometimes several hundreds pass within sight in a quarter of an hour. It is supposed they winter in Mexico and South America.

Perhaps there is no bird which is considered more decidedly wanting in principle than the WOODPECKER, and certainly, so far as man is concerned, there is none more conscientous. So long as a dead tree can be found for a nest, he will not trouble himself to bore into a living one. Whatever wounds he makes upon the living, are considered by gardeners as an advantage to the tree. The sound tree is not his object — he is in pursuit of insects and their larvæ.

The Woodpeckers, whose name indicates their habits, are widely spread, being found in most all quarters of the globe. The SPOTTED WOODPECKER is a constant resident in this State during the whole year. It feeds on insects and their larvæ. In looking at a fruit tree, for instance, we may frequently see a series of small holes, like those made by a small gimlet, completely and regularly encircling the trunk, and which are made by these species. All naturalists assert that it is only in seach of insects; and the structure of its tongue, which is barbed at the tip like all the other species, strengthens this opinion.

It appears to be an erroneous opinion that these birds injure trees.

Their only object in pecking the wood and bark, is to get at the insects which they know are hidden within. Now, insects seldom or never bore into healthy wood; but a decayed branch or stump is always full of them, as is well known to the entomologist. So the winged entomologist, when he perceives a decayed branch, or finds an unsound spot in the trunk, immediately sets to work industriously,

The Spotted Woodpecker.

and is rewarded by finding plenty of insects, which he draws out and demolishes, with more benefit to himself, and possibly more good to others, than many human entomologists can boast.

The RED-HEADED WOODPECKER is one of the most remarkable of American birds. Its tri-colored plumage — red white and black — is so striking and characteristic, and his predatory habits in the orchards and corn-fields, added to his numbers and fondness hovering along the fences, so very notorious, that almost every child is acquainted with the Red-headed Woodpecker. Toward the mountains, particularly in the vicinity of creeks and rivers, these birds are extremely abundant, especially in the latter part of summer. Whenever you travel in the interior at that season, you hear them screaming from the adjoining woods, rattling the dead limbs of trees, or on the fences, where they are perpetually seen flitting from stake to stake, on the roadside before you.

The HAWK enjoys a doubtful reputation in the hen-roost. He destroys young chickens, but, with the consistency of man, he does not like to see his infirmities copied by another, and, by way of compensation, demolishes the rat, which devours twenty chickens where he eats one; so that it is hardly the part of wisdom to set a price upon his head, while the rat, a hardened knave, is not honored even with a penal statue.

How the OWL came to be included in this black list, it is difficult to conjecture — who has nothing to do with man except to benefit him, by eating weasels, rats, moles and mice, a sin for which he equals in patience, and surpasses in alertness.

The BARN OWL affords another instance of mistaken persecution. This beautiful and most useful bird, whose carcass we so often see triumphantly nailed to the barn, actually feeds upon, and destroys in incalculable numbers, the rats and mice which bear it company in its underserved punishment. It also destroys great numbers of beetles, and other insects. It is possible that it may destroy young birds, but not probable, as feathers and birds' bones are never found among the rejectments. It will, however, when domesticated, devour a dead Sparrow, or other small birds, when presented to it.

The Barn Owl.

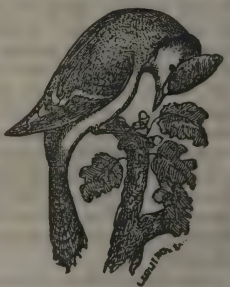
When farmers complain that the Barn Owl destroys the eggs of their pigeons, they lay the saddle on the wrong horse. They ought to put it upon the rat. Formerly, we could get very few young pigeons, till the rats were excluded from the dove-cot. Since that took place, it has produced a great abundance every year, although the Barn Owls frequent it, and are encouraged all around it. The Barn Owl merely resorts to it for the purpose of repose and concealment. If it were really an enemy to the dove-cot, we should see the pigeons in commotion as soon as it begins its evening flight; but they heed it not. Whereas, if the Sparrow-hawk should make its appearance, the whole community would be up at once.

Another of these persecuted birds — the BLACKBIRD — is the avowed enemy of the grub, like the Crow. The farmer knows, or should know, the value of his company to pluck them from the furrow; and while other less pains-taking birds collect vermin from the surface, his investigations are more profound, and he digs to the depth of several inches in order to discover them. When the insects are no

longer to be found, he eats the corn, as well he may; but even then he asks but a moderate compensation for his former services. Five hundred Blackbirds do less injury to corn than a single squirrel.

The Blackbird.

The common Blackbird is well known, and dreaded by our farmers for its attacks on the Indian corn. They appear with us about the middle of April; but, from causes not yet understood, they seem to have abandoned certain districts where they formerly appeared in great and destructive numbers. In the Southern or Atlantic district of this State, for instance, they are far less numerous than they were twenty or thirty years ago. They breed in every part of the State — selecting the hemlock, spruce or fir trees for their nests, and laying five or six dull green eggs, blended with dark olive. Their food consists of grubs, caterpillars, moths, beetles, and grain of various kinds. They are great pests in the cornfield when the first blades appear, pulling up the corn by the spear, and regaling themselves with the kernels. In fact, they are more injurious than the Crow, who has generally been accused of these depredations. We place them, therefore, on the list of depredators — black-coated rascals that they are.



The Blue Jay.

The Blue Jay.—This elegant bird is peculiar to North America, and is distinguished as a kind of beau among the feathered tenants of our woods, by the brilliancy of his dress, and, like most other coxcombs, makes himself still more conspicuous by his loquacity, and the oddness of his tones and gestures.

The Blue Jay is an almost universal inhabitant of the woods, frequenting the thickest settlements, as well as the deepest recesses of the forest, where his squalling voice often alarms the deer, to the disappointment and mortification of the hunter. In the charming season of spring, when every

thicket pours forth harmony, the part performed by the Jay always catches the ear. He appears to be among his fellow musicians, what the trumpeter is in the band — some of his notes having no distant resemblance to the tones of that instrument. Then he has the faculty of changing through a great variety of modulations, according to the particular humor he happens to be in. When engaged in the blandishments of love, his notes resemble the soft chatterings of a duck, and while he nestles among the thick branches of the cedar, are scarcely heard at a few paces distance; but no sooner does he discover your approach, than he sets up a sudden and vehement outcry, flying off and screaming with all his might, as if he called all the feathered tribes of the neighborhood to witness some outrageous usage he had received. When he hops undisturbed among the high branches of the oak and hickory, his notes become soft and musical; and his calls to the female, a stranger would readily mistake for the repeated creakings of an ungreased wheel-barrow. All these he accompanies with various nods, jerks, and other gesticulations, for which the whole tribe of Jays are so remarkable, that, with some other peculiarities, they might have very well justified the great Swedish naturalist in forming them into a separate genus, by themselves.

The Blue Jay is exceedingly mischievous; but as it rarely appears except in small numbers, its injuries are of little moment. It feeds on chestnuts, acorns, corn, cherries, large insects, caterpillars, and, in times of scarcity, has been known to feed on carrion. He sometimes pays a plundering visit to the orchard, cherry trees and potato patch, and has been known, when hard pressed, to venture into the corn-crib, through the openings. In these cases, he is extremely active and silent, and, if surprised in the fact, makes his escape with precipitation, but without noise, as if conscious of his criminality.

Of all birds, he is the most bitter enemy to the Owl. No sooner has he discovered the retreat of one of these, than he summons the whole feathered fraternity to his assistance, who surround the glimmering *Solitaire*, and attack him from all sides, raising such a shout as may be heard, in a still day, more than half a mile off. "When in my hunting excursions," says Wilson, "I have passed near the scene of tumult, I have imagined to myself that I heard the insulting party venting their respective charges with all the virulency of a Billingsgate mob; the Owl, meanwhile, returning every compliment with a broad, goggling stare. The war becomes louder and louder, and the Owl, at length forced to betake himself to flight, is followed by the whole train of his persecutors, until driven beyond the boundaries of their jurisdiction."

The Cat-bird is a very common species in the United States, and one as well known to all classes of people as his favorite currant and blackberry bushes. In spring or autumn, on approaching thickets or brambles, the first salutation you receive is from the Cat-bird; and a stranger, unacquainted with his note, would instantly conclude that some vagrant orphan kitten had got bewildered among the briars, and

wanted assistance. He is unsuspicious, and extremely familiar; for whether in the woods or in the garden, where he frequently builds his nest, he seldom allows you to pass without paying his respects to you in the usual way. The nest is composed of dry leaves, weeds, small twigs, and fine, dry grass, lined with fibrous roots. The birds show no great solicitude for concealment, though few are more interested for the safety of their nest and young. It is one of our most useful birds, but usually doomed to persecution and death by thoughtless ignorance.

The Cat-bird, like the Robin, is one of our earliest songsters, beginning generally before break of day, and hovering from bush to bush with great sprightliness, when there is scarcely light enough to distinguish him. His notes are eminently beautiful, although few suppose him capable of emitting any other sound than the harsh and discordant *mew*, which has given rise to his trivial name. His song is more remarkable for singularity than melody. His notes consist of short imitations of other birds, and other sounds, some not unlike the mewing of a cat; but his pipe being rather deficient in clearness and strength of tone, his imitations fail where they are requisite; yet he is not discouraged, but seems to study certain passages with great perseverance, uttering them first low, and, as he succeeds, higher and more free — no ways embarrassed by the presence of a spectator, even within a few yards of him. On attentively listening to him for some time, you can perceive that he introduces into his performance all the odd sounds and quaint passages he has been able to collect. Upon the whole, he merits a place among the most agreeable of our *general* performers.

The Cat-bird.

Few people in the country respect the Cat-bird. On the contrary, it is generally the object of dislike; and the boys of the United States entertain great prejudice and contempt for this bird, its nest and young. The principal cause of this dislike, seems to be some similarity of taste and clashing of interests between the bird and the farmer. The Cat-bird is fond of large, ripe garden strawberries — so is the farmer, for the good price they bring in market. The Cat-bird loves the best and richest early cherries — so does the farmer, for they are sometimes the most profitable of his early fruit. The Cat-bird has a particular partiality for the finest, ripe, mellow pairs — and these are also particular favorites of the farmer. But the Cat-bird has frequently the advantage of the farmer, by snatching the *first fruits* of these delicious productions — and the farmer takes revenge by shooting him down with his gun, as he finds old hats and scarecrows are no impediments in his

way to these forbidden fruits. And thus commences a train of prejudices and antipathies, that commonly continue through life.

The redeeming qualities of the Cat-bird are his fondness for insects of various kinds, the music of his song, and the interesting playfulness of his manners, which will always be more than a recompense for all the little stolen morsels he snatches.

The American Robin.—This well-known bird, being familiar to almost everybody, will require but a short description. The American is less harmed, possibly on account of its connection with its English cousin, the Robin Redbreast, whose oft-told charity to the "Babes in the Wood" has turned aside from its posterity even the unsparing hand of the school-boy.

The American Robin.

The Robin is one of our earliest songsters; even in March, while snow dapples the fields, some few will mount a stump or a stake of the fence, and make short and frequent attempts at a song. His notes in spring are universally known, and as universally beloved. They are, as it were, the prelude to the grand general concert that is about to burst upon us from woods, fields and thickets, whitened with blossoms, and breathing fragrance. By the usual association of ideas, we therefore listen with more pleasure to these cheerful birds than to many others of far superior powers, and much greater variety. Even his nest is held more sacred among school-boys than that of some others; and while they will exult in plundering a Jay's or a Cat-bird's, a general sentiment of respect prevails on the discovery of a Robin's. He possesses much suavity of manners, and always seeks shelter for his young in summer, and subsistence for himself in the extremes of winter, near the habitations of man.

Their principal food consists of berries, worms and caterpillars. Of the former, they are very fond of the berries of the mountain ash; and so fond are they of them, that wherever there is one of these trees covered with fruit, and flocks of Robins in the neighborhood, the sportsmen need only take his stand near it, load, take aim and fire — one flock succeeding another, with little interruption, almost the whole day. By this method, prodigious slaughter has been made among them, with little fatigue. When berries fail, they disperse themselves

over the fields, and along the fences, in search of worms and other insects. Sometimes they will disappear for a week or two, and return again in greater numbers than before; at which time the cities pour out their gunners (we cannot say sportsmen) by scores, and the markets are plentifully supplied with them. But we consider it wicked and barbarous in the extreme to murder these innocent creatures, and the practice should be discountenanced by every humane person.

In the midst of such devastation, a few years ago, some humane person took advantage of a circumstance common to these birds in the fall, to stop the general slaughter. The fruit called poke-berries is a favorite repast with the Robin, after they are mellowed by the frost. The juice of the berries is of a beautiful crimson; and they are eaten in such quantities by these birds, that their whole stomachs are strongly tinged with the same red color. A paragraph appeared in the public papers, intimating that, from the great quantities of these berries which the Robins had fed on, they had become unwholesome, and even dangerous food, and that several persons had suffered by eating them. The strange appearance of the bowels of the birds seemed to corroborate this account. The demand for, and use of them, ceased almost instantly, and motives of self-preservation produced at once what all the pleadings of humanity could not effect.

In the winter, when the berries are gone, insects dead, and the worms hidden under the hard-frozen soil, then the Robin flies for refuge to the habitations of man for shelter and food. It is very amusing to see the half-trusting, half-fearful look with which it hops to the window-sill for the first time. After a while it becomes bold, and taps at the window if the expected crumbs are not thrown out. Before very long, it ventures to enter the room, hops about, and quite seems to consider as a right what was first merely a favor. When once established, it is very jealous, and will not suffer a friend to be a partaker of the same comforts, but attacks him with the greatest fury; so the unfortunate second comer has to wait shivering outside the window, with his feathers puffed up, and his little bright eye glancing from the depths of his plumage.

Should the Robin plunder a few of your cherries, do not denounce him; for he is more serviceable, in destroying grubs and insects, than ten times the value of the fruit he eats.

The Cedar-bird.—This little, impudent, well-known bird, has various popular names. Those of Cedar-bird and Cherry-bird are most common in this State. In Massachusetts, it is called Canada Robin, and by the French Canadians it is known under the name of Recollet, from the color of its crest resembling the hood of that religious order. It is frequently called the Brown-bird. Like its European representative — the Waxen Chatterer — it is capable of bearing a considerable degree of cold. Where great elevation or latitude tempers the climate, so as to be favorable to the production of juicy fruits, the Cedar-bird will probably be found either almost wholly to reside, or to pass the season of reproduction,

The Cedar-bird appears in flocks, and lives upon whortleberries, cedar berries, persimmons, grapes and cherries. They are best known for their fondness for cherries, which they devour with great avidity, and in large quantities. They are not, however, exclusively frugivorous, but repay comparatively unimportant injuries which they inflict on man, by ridding the trees of the small beetles, caterpillars and canker-worms with which they are infested.

Leaving the northern part of the continent at the approach of winter, they assemble in companies of twenty to a hundred, and wander through the Southern States and Mexico to the confines of the equator, in all of which countries they are now either common or abundant. As observed by AUDUBON, their flight is easy, continued, and often perfomed at a considerable height; and they move in flocks or companies, making several turns before they alight. As the mildness of spring returns, and with it their favorite food, they appear in this State about the beginning of April, before the ripening of their favorite fruits, the cherries and mulberries. But at this season, to pay the gardener for the tithe of his crop, their natural due, they fail not to assist in ridding his trees of more deadly enemies which infest them, and the small caterpillars, beetles and various insects now constitute their only food; and for hours at a time they may be seen feeding on the all-despoling canker-worm which infests our apple and elm trees.

The Cedar, or Cherry-bird.

On these occasions, silent and sedate, after plentifully feeding, they sit dressing their feathers in near contact, on the same branch; and as the season of selective attachment approaches, they may be observed pluming each other, and caressing with the most gentle fondness. This friendly trait is carried so far, that an eye-witness assures us he has seen one among a row of these birds seated upon a branch, dart after an insect, and offer it, when caught, to his associate, who very disinterestedly passes it to the next, and each delicately declining the offer, the morsel has proceeded backwards and forwards before it was appropriated.

In mitigation of the crime of plundering our cherries by these birds,

a recent writer observes: "Last summer, just as my cherries began to ripen, the Cherry-birds came upon my trees in flocks, and very suddenly. It was Sunday, and as I could not allow them to be killed on that day, I took all sorts of pains to keep them away. But my labor seemed to little purpose, and I was quite disposed to have war declared upon them the next day. When Monday came, back came the birds. Still, I did not like to have them shot, and made up my mind that I would divide with them. While watching the little rascals plunder my fruit, right over my head, I noticed that they never took the whole of the cherry. This led me to further investigations, and I soon discovered that they never disturbed a sound cherry, and none but those that had worms in them. I gave directions that they should not be disturbed, and walked away a wiser, and, I trust, a better man, for the lesson was an instructive one. I have never yet seen any bird take a sound cherry; and I am glad to see the birds among the fruit. Spare the birds, and they will destroy millions of your worst enemies — the insects."

The KING-BIRD, as it is called in this and the Eastern States, or Field Martin, as it is termed elsewhere, is a well-known and common species. It winters in Mexico, and generally appears in this State in the latter part of April or beginning of May. It leaves us for its winter quarters in September or October, according to the season. It breeds in every part of the State, and feeds on berries and seeds, beetles, canker-worms, and insects of every description. By this, and by his inveterate hostility to rapacious birds, he more than compensates for the few domestic bees with which he varies his repasts. The King-bird stands at the head of the Fly-catcher tribe. His habits are well known to every farmer, and he is distinguished for his love for the honey-bee, and his fondness for seeking every opportunity to lease a Hawk or a Crow. This constant habit of the King-bird in attacking birds of prey, and driving them from the precincts of the farm-yard, together with his feeding upon insects, renders him of service to the farmer, and more than counterbalances the mischief he sometimes occasions by his fondness for honey-bees.

The King-bird.

We cannot do better, in vindication of the character of the King-bird, than to quote the language of Mr. WILSON, who says: "The death of every King-bird is an actual loss to the farmer, by multiplying the numbers of destructive insects, and encouraging the depredations of

Crows, Hawks and Eagles. For myself, I must say that the King-bird possesses no common share of my regard. I honor this little bird for his extreme affection for his young — for his contempt of danger, and unexampled intrepidity."

The SPARROW is, with the Blue-bird, the earliest harbinger of spring. All kinds of the Sparrow family are very industrious insect exterminators. A single pair have been known to carry five hundred insects to their nest of young within an hour. They indeed eat a portion of the grain from the fields, and the seeds from the garden; but the injury is very slight, when weighed against the advantage of their unceasing war against all the insect tribe. They are very domestic, not only frequenting the garden, but venture to our very threshold in search of food. In early spring, when insects and seeds are scarce, we have induced them to visit our window over the piazza, by scattering crumbs of bread on the roof, and were generally paid with their melody.

The Sparrow.

"Among the delights of spring," says HAWTHORNE, "how is it possible to forget the birds. The smaller birds — the little songsters of the woods, and those that haunt man's dwellings, and claim human friendship by building their nests under the sheltering eves, or among the orchard trees — these require a touch more delicate, and a gentler heart than mine to do them justice." If HAWTHORNE, one of our most gifted and popular writers, could thus express a distrust of his power to do justice to our birds, how can we hope to succeed in the attempt? But, if by any remarks upon their habits, we should induce the farmer or gardener to afford them protection, our object will be accomplished.

The next bird we shall notice is the BLUE-BIRD, one of our earliest spring visitors. It is said to resemble very much the Robin Redbreast of England. It has a mild and peaceful disposition, which, coupled with its early appearance in spring, and its domestic habits, render it a general favorite. It feeds upon insects in the early part of the season, and in autumn adds to its bill of fare wild cherries, cedar berries, and other wild fruit.

In some sections of the country, one of the most useful birds is the WREN, the friend and companion of man, who delights to build his nest under the eves, or in the nearest proximity to a human dwelling. In some places, his usefulness is so well understood and appreciated, that small fancy houses, fastened to trees or set upon a post, and other

convenient places are prepared, such as an old hat with a hole in the top, and the rim nailed to the side of an out-building, where they may build their nests. As soon as the young brood are hatched, the parents begin to fly about in search of food for their young family. An observing lover of birds counted fifty times in one hour that one pair of Wrens went forth to bring food to their nestlings, and he says they never returned without an insect in their bills. This perpetual flying forth and returning is repeated, without intermission, from morning to night, and continued till the young birds are able to fly forth themselves. In this ratio, one pair of Wrens must destroy vast numbers of vermin; and even if they sometimes nip the sides of a strawberry or cherry, a reasonable person will consider this sweet morsel but the honest due of the zealous and faithful guardians of his trees.

The Wren.

The Sparrows and Wrens prey upon insects in another stage of their existence — when they first come out of their eggs, and lurk within the buds, leaves and flowers of plants.

The House Wren.

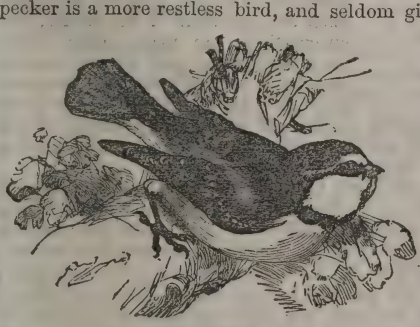
The CHICK-A-DEE is one of the most lively and industrious of our birds, and, on account of his permanent residence with us, one whose absence would be sadly missed if his race were to become extinct. He is a great favorite of all — active, noisy and restless — hardy beyond any of his size, and bearing the severest cold. In winter he becomes very tame, approaching the house to pick up the crumbs of bread and refuse of the pantry. You may see him almost any day, at this season of the year, whether you live in town or country, as he seldom fails of visiting the wood-pile, apple tree, currant or rose bushes, and sometimes resting upon the window-sill; and if a few crumbs of bread are thrown out to him, he is sure to renew his visit daily, bringing some of his companions with him — while it is very amusing to see how cheerful and happy they are, as, with their little, naked feet, they hop about on the snow and among the

frozen branches, often repeating their lively notes, which sound very much like pronouncing the word "Chick-a-de-de."

We are indebted to the Chick-a-dee for a great part of the cheerfulness that attends a winter's walk. Though he is not reckoned among the singing birds, there is variety in his notes, and he is a lively chatterer and an agreeable companion; and as he never tarries long in one place, he never tires one, either by his presence or his garrulity. We associate him, therefore, with all our pleasant walks in the orchard, in the woods, in the garden, or our own immediate enclosures. We have noticed him on still winter days, flitting from tree to tree in the garden and orchard, with the most lively motions and engaging attitudes, examining every twig and branch, about the roots of the leaves, buds, and crevices of the bark, winding over and under, and in and out, searching for insects and their larvæ; and then, with a few rapid notes, hopping to another tree to go through the same pleasant evolutions. Nothing can exceed either his cheerfulness or his industry, of which he might most truly be made emblematical.

The Chick-a-dee.

The frequent companions of the Chick-a-dee, are the common CREEPER, and the DOWNY or SPECKLED WOODPECKER; but the Woodpecker is a more restless bird, and seldom gives the branches of trees so thorough and scrutenizing an examination as the Chick-a-dee. The former searches for certain grubs that are conconcealed in the wood of the tree; he examines those places only in which they are likely to be found, listens for their scratchings, bores the wood to obtain them, and then flies off. But the Chick-a-dee looks for insects on or near the surface, is never weary or satisfied with his examinations, and does not confine his search to the branches of trees; he examines the fences, the under part of the eaves, and the clapboards of all buildings, for chrysalids and cocoons, and destroys, in the course of his foraging, many an embryo moth and butterfly, which would become the parent of noxious



The Creeper.

larvæ. Hence, there is probably no other American bird that destroys, in the course of the year, so large a quantity of insects, as he continues his operations in the winter, when there is but a small proportion of any other food to be obtained, and he is obliged, by necessity, to be very diligent in his work.

These birds sometimes fight violently with each other, and are known to attack young and sick birds that are incapable of resistance, always directing their blows against the skull. As they feed exclusively on insects, they are truly friends, and useful to the farmer and horticulturist.

Another of our feathered visitors, who follows close upon the steps of winter, is the PHŒBE-BIRD. He is a sociable little fellow, and seeks the habitation of man. A pair of them built their nest beneath the roof our porch, on the cap of one of the columns, and have reared several broods there, their nest being never disturbed. They become half domesticated — will set and hatch their young without fear of molestation by the members of the family.

The Phœbe-bird.

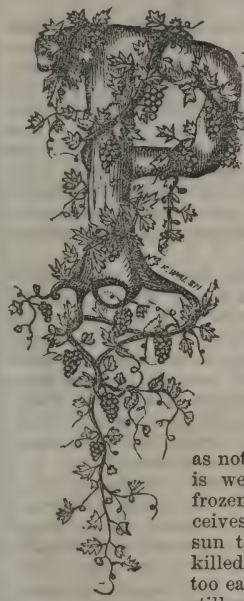
They arrive early in the spring, just when the crocus and the snow-drops begin to put forth. Their first chirp spreads gladness through the house. "The Phœbe-birds have come!" is heard on all sides. They are welcomed back like members of the family, and speculations are made upon where they have been, and what countries they have seen, during their long absence. Their arrival is the more cheering, as it is pronounced, by the old weather-wise people of the country, the sure sign that the severe frosts are at an end, and that the gardener may resume his labors with confidence.

These familiar and favorite little birds winter from South Carolina to Mexico. They appear with us in the latter days of March or beginning of April, and their appearance is hailed as the certain harbinger of spring. They leave us in October or November, according to the nature of the season. They feed in the spring and summer on insects; in the winter, on berries and seeds of various kinds. They are, therefore, useful to the farmer, gardener and fruit-culturist, and should be protected and encouraged to build their nests near our houses. We have known them to take possession of a deserted Martin-box, and build their nests in it. Sometimes the Blue-bird claims a right, and fierce and bloody battles are fought for possession.

CULTIVATION OF THE GRAPE.

WRITTEN FOR THE RURAL ANNUAL BY JOSIAH SALTER, ROCHESTER, N. Y.

SOIL, SITUATION AND EXPOSURE.



PERHAPS it is needlesss to say that the best site for a vineyard is the south side of a hill, where the vines at mid-day will be fully exposed to the full influence of the sun. There the vines will get the proper sunshine and light so necessary to the full and healthy development of leaves and fruit. They will there be sheltered from the chilling north-east winds sometimes so prevalent in spring and early summer, and very liable to bring mildew to the young and swelling fruit in the month of July. A south-eastern exposure is also good, because it receives the sun pretty early in the morning, and is exposed until late in the afternoon. A full east exposure is not so good, because it is exposed to eastern winds; and the vines are very liable to injury from late spring frosts, the sun coming upon the vines so suddenly as not to give them time to thaw out gradually. It is well known that tender vegetation, slightly frozen in the spring, if thawn out in the shade, receives little or no injury; but when exposed to the sun to thaw out suddenly, is almost sure to be killed. A full east exposure also loses the sun too early in the afternoon. A western exposure is still worse, from its receiving the sun so very late in the afternoon, and is liable to suffer from chilly evening dews. It is also more liable to suffer from west winds and driving storms.

Hill-sides, or elevated ground where the soil is naturally dry, warm and deep, is absolutely necessary to the well-being of the vine. It not unfrequently happens that high ground is very springy and wet, but such places are usually very readily underdrained.

Grape vines cannot thrive long in low, wet, cold situations — the roots are apt to canker and rot, and the grapes are liable to be affected with the wet-rot, and are invariably watery, insipid, and of poor fla-

vor, and *never* make the *best* wine. In such places, the sun's rays hardly ever fall upon the vines with full force and in the proper direction, so as to thoroughly warm the soil and ripen the wood of the vine, and give flavor to the grape. Moreover, grape vines in such localities are far more liable to be heaved by severe winter freezing; the wood not being thoroughly ripened, is unable to withstand the severity of the winter, and also more subject to mildew in summer; and, in addition, they must necessarily be more liable to the depredations of injurious animals, such as mice, muskrats, &c., as they are well known to frequent low, wet places, rather than high and dry ones.

There is, however, a great difference between the foot, the middle and the summit of a hill. The top of a hill is very frequently too exposed to the cold north winds; and moreover, is frequently too stony and poor, all the organic matter having been washed down on to the hill-side and into the bottom. The foot of the hill, not receiving adequately the full force of the sun's rays during the day, is more or less subject to late spring frosts. The middle of the hill, therefore, is the best; the fruit comes to maturity earlier, and has a longer time to more perfectly ripen, and is, consequently, more fit for wine, and of better flavor for the table. The wood of the vine, also, is more thoroughly ripened, and is, therefore, better enabled to withstand the inclemency of the winter.

The vineyard should not be located very near low, wet woods, large ponds, swamps, lakes, marshes, &c., as such places always generate fogs and mists in the latter part of summer and early fall, just when the driest atmosphere is wanted for ripening the grapes. There should not be large hills, high trees or large buildings near enough to cast a shade upon the vines. Nor should vineyards ever be made in deep gulleys, valleys or ravines. Such places always cast much shade morning and evening, and create whirling currents of wind, which collect much snow in winter, which is liable to break down the vines. They also harbor all kinds of noxious animals, such as mice, &c.

The quality of the soil, also, is of the utmost importance. The grape vine will live, it is true, where any other hardy shrub will grow; but if planted in cold, wet, stiff, clayey soil, it cannot thrive many years, and the grapes, if they ripen at all, will be watery and insipid. The only way in which such a soil can be made fit for the grape vine, is by mixing with it great quantities of marl or lime mixed with sand, or like quantities of sandy loam, and by thorough draining. The opposite extreme, however, of light, sandy, poor soils, unless well mixed with clayey marl, turfy, loamy sods, lime, or decomposed vegetable soil from the woods, is also bad. The most suitable soil, is that deep, rich, loamy, gravelly, porous and well-drained soil, well mixed with lime and gypsum, such as we see so much of in Western New York. In fact, any soil that will grow first-rate winter wheat, will grow good grapes. The best situation, therefore, is the south side of a gently rising hill, well sheltered all around on the north and north-east by some higher hills or distant woods.

It may so happen that a gentleman may want to plant a vineyard who has not the desired kind of soil. I would then say, choose the best you have, and add the necessary constituents to make it good. Every man who has a rod of ground should plant a grape vine, and plant as many as he has room for, or can afford to plant. No other fruit-bearing plant will so well repay any one for care or neglect. Its abundance of luscious fruit is as easily kept fresh through the winter as any other fruit, and it makes excellent preserves, and is easily manufactured into wholesome wine.

PREPARATION OF THE GROUND.

There are but very few vineyards properly prepared in America. Labor is so very high in this country, as to make it seem almost out of the question to properly prepare a vineyard. There are very few gentlemen in this country wishing to plant out a vineyard, who have the courage to lay out for labor seventy-five or one hundred dollars per acre, for trenching and turning up the soil alone. And yet it is absolutely necessary to the thrift and longevity of the vines, that the ground be trenched and broken up three or four feet in depth. In Europe, many of the best vineyards are trenched to the depth of three, four, and even five feet. The ground is trenched the fall previous to planting, and not unfrequently has been prepared by seeding down with clover two or three years preceding the time of trenching, and has had one or two good coatings of gypsum and manure.

Should the ground be at all wet or springy, it will be absolutely necessary to thoroughly underdrain it before planting. This is, perhaps, best done before the trenching or plowing. The main drains should be laid thirty, forty or fifty yards apart, according to the state of the land, whether it be very wet, or only a little springy. The main drains should be laid up and down the hill, coming out into an open ditch at the bottom of the hill. The cross drains should run diagonally down the hill into the main drains, and be laid about nine yards apart, and sunk to the depth of three and a half to four feet. This running down the hill gives an impetus to the water that will clear out any sediment that may collect in the pipes.

Few persons are fully aware of the importance of thorough drainage as a means of meliorating the soil, and none but those who have witnessed its results can fully appreciate its great benefits. By draining, the soil is kept from being too wet, and also preserved from the ill effects of severe drouth — it is warmed by the summer showers, which, instead of running off over the surface and washing away the soil, soaks to the bottom of the loose earth, and the superabundant water is carried off through the drains, leaving its rich gases, which have been collected in falling through the air, in the soil for the young absorbents of the plants. In excessive dry weather, moisture is drawn from the depths of the soil by capillary attraction, thereby keeping it moist to the very surface, and preserving the plants in health and vigor in the most pro-

tracted drouths. Where ground is thoroughly drained, plants are not so likely to be affected by winter heaving; the soil becomes dry and warm much earlier in the spring, and the plants commence a vigorous root action one or two weeks before the buds begin to burst; they are thereby better enabled to force and sustain a more vigorous growth of foliage when it does start; the wood becomes more thoroughly ripened in the fall, and is better fitted to stand severe winter freezing.

The ground intended for a vineyard should receive a good manuring the year previous to planting, to be turned in and thoroughly mixed with the soil in the trenching — either a good coating of lime, where that kind of manure is wanting (which will not be if there be much lime rock in the soil), or a good application of gypsum, where it can be had, or a good coating of barn-yard manure, decomposed vegetable mould from the woods, turfy sods, the cleanings-out of ditches, street scrapings and sweepings, or a good clover sod plowed in previous to trenching.

When the ground is thus prepared, it will be ready to commence the trenching. Stretch a line across the ground, and mark out a trench four feet wide and the whole length of the piece to be trenched. Then dig out the soil the whole width of the trench, and two to three or four feet deep, according to the depth it is intended to be trenched, and with the teams draw the soil to the opposite side of the vineyard, where the trenching will be completed. This soil is to fill in the last trench at finishing, to complete the work. When the first trench is completed, mark out a second four feet wide, as before. Now dig the surface soil of the second trench to the depth of one foot, or as deep as the best steel spades can be made to dig, setting them as nearly perpendicular as possible. Throw the top soil of the second trench into the bottom of the first; then, with a shovel, scrape up all the loose earth that fell from the spade in digging the first spit of the second trench, and throw it into the first. This done, next dig the subsoil of the second trench one foot deeper, and throw it into the first trench upon the top soil that was thrown from the second. Scrape up all the crumbs, as before, and throw them on top of the subsoil. If the ground is to be trenched only two spades deep, then loosen up the bottom soil with the pick as far as the pick can be sent in, throwing out all the large stones as you work along. If the ground is to be trenched three or four feet deep, this last picking will not be so necessary. If there are large quantities of vegetable refuse at hand, such as grass, weeds, rotten leaves, straw, clippings of hedges, or very small brushwood, it may all be thrown into the bottom of the trenches as they are proceeded with. Let this trenching be done well, for remember that this will be the last opportunity you will ever have of doing it; and I apprehend no one will deny that it is always better to have a small vineyard done well, than to have a large one managed badly. It may be objected to by some persons, that the surface soil should be thrown into the bottom of the trench, and the subsoil upon the top to plant the young vines in; but when it is remembered that the young vines will soon root down into

the good soil below, and that the surface soil will become better every year by applications of manure or compost and cultivation, I think those objections will soon vanish. Let the third and the fourth trenches be done as the first and second, and so on through the piece.

If the vineyard to be trenched be a very steep hill-side, it will require terracing. This is best done by beginning at the foot of the hill. Stretch a line as a guide, and commence by trenching as on level ground. The soil thrown out from the first trench will not require to be drawn away, but merely turned over and made level, so as to form a terrace, or bench. The width of these terraces will depend upon the declivity of the hill-side; and they will require some kind of walling, or sodding, to keep them up, so as to prevent heavy rains from creating currents and washing down the soil. If the ground be thoroughly trenched, there will be found, in most hills, stone enough to do the walling; but where there is not stone enough, the embankments may be kept up by covering them with sods. The embankments should stand out a little at the foot, or falling back towards the hill, so as to prevent sliding down as much as possible, and the sods cut in the form of a rhomb. They then have a mechanical power of holding each other up, which they lose when cut perfectly square; and the trouble of cutting the one is the same as that of the other. To get the sods of the desired shape, stretch a line across the turf to be cut, and make a cut therein with the spade or racer to the depth of two or three inches. Then move the line, and make another cut twelve or fifteen inches from, and parallel with, the first, and so on until a number are cut. Then stretch the line diagonally across these cuts, and at the same distances, and cut as before. This gives the sod the desired shape, and,

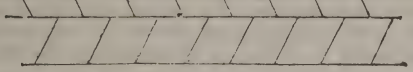


Fig. 1.

when put up, all to fit. When laid up, they will somewhat resemble fig. 1. Should there be any danger of the sods sliding down after this, they can be fastened up with wooden pegs, say a foot long and an inch in diameter, and driven through the sod into the bank. But sods are not as good as stones; the grass tends to create damp during the night, and its roots growing in the bank absorb a great deal of moisture and nourishment from the earth that properly belongs to the vines. Stones do not do this, but they absorb a great deal of warmth from the sun during the day, and give it off slowly during the night, thereby tending to keep the earth and atmosphere warmer through the night. These walls, if properly laid up, will last as long as the vines. And if

the trenching be thoroughly done, and the vines carefully managed, I see no reason why they should not continue to thrive and be remunerative for a hundred years; since we know there are vines still in existence upwards of two hundred years old, and bearing nearly a ton of grapes to a vine every year — among which is the large *Hamburgh* vine at Hampton Court, near London, England, which frequently bears from two thousand five hundred to two thousand six hundred bunches, weighing from one thousand six hundred to two thousand pounds — although it can hardly be expected such vines will be grown in the open air.

There are other modes of preparing the ground than trenching with the spade. The next best is to plow the ground with a large plow, and follow in the open furrow with a subsoil plow, thereby breaking the ground to the depth of eighteen to twenty-four inches. Next to subsoiling, will be good, deep plowing; and next to that, merely digging large holes, and planting in a good compost mixed with the soil out of the holes.

The trenching, as first recommended, in ordinary soils, will cost from seventy-five to one hundred dollars per acre; and trenching two spades deep, without throwing out the loose earth, about fifty dollars per acre. The plowing with large plows and heavy teams, and subsoiling, will cost about twenty-five dollars per acre; and merely digging holes, or good plowing, will cost from ten dollars to fifteen dollars per acre — but this will depend on the character of the soil, and the number of holes to be dug.

The best time to prepare the ground is in the fall previous to planting in the spring. This should be done in fine, open, dry weather; for when done in wet weather, the ground becomes trodden into slimy, pasty clods, which, in some soils, when they have become dried and buried beneath the surface, are almost impervious to air and water. And the ground should be left in as rough a state as possible all winter; for the rougher the soil, the greater will be the surface exposed to the atmosphere to be acted upon and pulverized by the winter's freezing, and enriched by the rich gases and salts which have been collected by the rains and snows, in winter, in falling through the atmosphere.

LAYING OUT THE VINEYARD.

The ground having been properly prepared (by harrowing, cultivating or raking, as circumstances may suggest,) in the spring, as soon as the frost is out, and the ground in good working order, that it may be made as smooth and even as possible, the next thing to be considered will be the marking out the proper places where the vines are to be planted. Some difference of opinion exists among planters as to the proper distances the vines should be planted. The prevailing opinion is that four by four feet is the proper distance, where tied to poles. Some plant three by four, three and a half by four, three by five, and four by six, and all other distances, as fancy may dictate. But four

feet each way is the commonly adopted distance in this country for the *Catawba* and *Isabella*, and is believed to be the best, where trained to stakes or poles. In France, I have seen some excellent vineyards planted two by four, three by four, four by four, and six by twelve, and all seemed to do remarkably well. Those planted two by four were allowed to grow where they listed; they had no stakes, and received very little pruning, but spread all over the ground, and completely smothered the weeds. They bore a great crop of excellent grapes, and, after the fruit was gathered, were pruned back to a mere stump, and the prunings left on the land and buried in the soil with an instrument something like a two-pronged hoe, called a *crotchet*. It is a very slovenly way; and how long the vines would continue to be fruitful, I cannot say. Those planted three by four and four by four were carefully tied to stakes about three feet high out of the ground, and carefully pruned and trained. Those planted six by twelve, were trained to espaliers about eight feet high, running east and west. Those grown on the espaliers were of the *Chasselas Fontainebleau* variety, and produced some of as fine fruit as I have ever seen, of the same variety, grown under glass in this country. The *Muscat of Alexandria* ripened exceedingly well on the south side of a house; but 1847 was a first-rate fruit year in France. The soil was a deep, gravelly loam, with a great deal of lime rock, and gypsum was seen in almost every broken stone. Having decided on the distances the vines are to be planted apart, the next thing is to lay the ground out as nearly square as possible. Then prepare a number of little stakes, sharpened at one end; and if four feet apart each way be the distance, it will take about two thousand seven hundred to the acre. These are best prepared by taking a straight-grained pine board, one inch thick, and sawing it into lengths of about eighteen inches; split it into strips half an inch thick. These being white, will be better than any others in sighting the rows through, and can be prepared in the winter or on wet days. Now take a good line, long enough to reach across the entire vineyard, and insert into it little pieces of red tape, at exactly four feet apart, the whole length. This is called the marking-cord. Now, the cord and the sticks being ready and the ground squared, fasten the cord at the south-east corner, and draw it to the south-west corner; strain it tight and fasten it. Then have one or more hands to place in the sticks *exactly* at these little bits of tape in the cord; set them upright, and, when placed, sight them through, to see if they are straight. Now take up the cord at the south-east corner, and carry it to the north-west corner; strain it tight, and place in the sticks, as before. Then proceed from the south-west corner to the north-east corner, and place the sticks as before; and thence to the south-east corner, or place of beginning. When the outside lines of sticks are set perfectly straight, and exactly four feet apart, and the whole piece perfectly square, then take up the cord at the south-east corner, and place it at the second stick from the south-east corner, and stretch it across to the second stick from the south-west corner; now place the sticks again at the

pieces of tape in the marking-cord. Now one man at each end of the cord to take it up and move to the next stick, and place in the sticks, as before; and so on until all are placed. When all the sticks are set, sight them through, to see that they are in straight rows every way. It is necessary that the sticks stand in perfectly straight lines; for nothing gives more pleasure to the nice vine-dresser than to see the vines standing in their exact places, and nothing looks more unsightly than to see them planted all over the place, as though they had grown there by accident. Fig. 2 will fully illustrate this mode of marking.

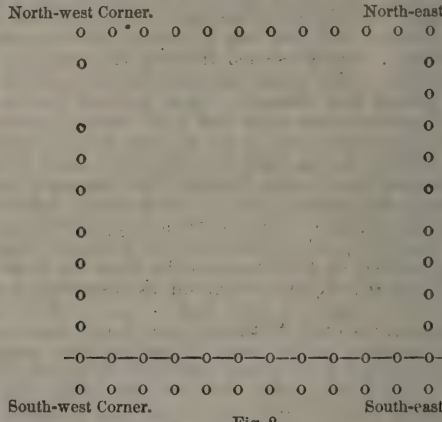


Fig. 2.

The direction of the rows should be north and south, and east and west, as nearly as possible, so as to give the vine the full benefit of the sun's rays in every possible direction.

PROPAGATION OF THE VINES.

Having thus described some of the best modes of preparing the soil and marking off the vineyard, I will now endeavor to explain how the vines may be propagated and multiplied.

Grape vines are propagated from seed, by buds or single eyes, cuttings, layers, grafting, inarching and budding.

It is to be presumed that no one will attempt to plant out a vineyard from seed — the chances of getting a good one are too few. The grape vine is so liable to degenerate when raised from seeds saved promiscuously, that to get one really good one to every ninety-nine poor ones, is a very good proportion. More may be expected from half a dozen carefully hybridized seeds, than from a hundred accidentally saved.

If any one is desirous of raising new varieties from seed, he had

better spend a little time in hybridization. As the young seedlings are most likely to partake more of the constitutional character of the female parent than of the male, perhaps the best varieties to experiment upon, to produce a black variety, would be the *Isabella* or the *Concord* for the female parent, fertilized with the pollen of the *Black Hamburgh;* and the *Diana* or the *Delaware*, fertilized with the *Rose Chasselas*, for a red; and the *Rebecca*, crossed with the *Golden Chasselas*, for a white. These seedlings would be most likely to partake of the hardy constitution of the natives, and of the fine flavor of the exotics. As the foreign varieties will almost invariably have to be grown under glass, they will be most likely to come into bloom before the native varieties out of doors; and to insure those to be operated upon expanding their flowers at the same time with the exotics, it will be necessary to have some of the native varieties grown in pots, that they may be moved into the cold grapery early in the spring, or protected with a temporary glass structure.

As the hybridization of the grape vine is rather a nice operation, it will require some close attention and watching to catch the flower just before it expands. The corolla should then be removed, the anthers cut away, and the stigma fertilized with the pollen of the exotic variety. If, on cutting away the corolla, it is seen that the anthers have burst, the whole flower must then be cut away, as it is most likely it will have fertitized itself by its own pollen, and will frustrate the whole operation. One or two bunches on a plant, and these thinned out one-half, will be enough to attend to at a time.

Eyes.—The native varieties are very readily multiplied by single eyes. An eye is a small portion of the one-year-old wood, having but one bud. In the month of February or March, take one-year-old, well-ripened wood, and cut it into as many pieces as there are well-ripened buds. Cut the eyes one inch above the bud, and two inches below it, as in fig. 3. Then take cutting-pans or boxes, four inches deep, and of any size to suit convenience, and put in about one inch of broken charcoal or potsherd, or anything rough and loose, for drainage, and over that a thin layer of moss, or the siftings of leaf-mould, to keep the drainage clear, and then fill to within half an inch of the top (pressing it pretty firm with the hands) with finely-sifted leaf-mould from the woods, and lake sand, if it can be had — if not, any fine, light, rich earth, that is very porous, will do; about one-fourth sand will be the right proportion. Then press the cuttings into the soil up to the bud, in a somewhat slanting direction, and about one inch apart, keeping the bud uppermost, and just above the soil. The bud must not be buried, as it is very apt to rot. They should then be placed in a temperature of about 60° by night, and 75° to 80° by day, and carefully attended to for water. The soil should be kept just moist, and they will nearly all grow. When they have rooted, they will have to be potted off

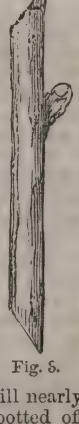


Fig. 3.

singly, or be planted out in the open ground, if warm weather. If the weather should prove dry at the time of planting out, it will be necessary to give them some water; but when water is applied, give them a thorough soaking, that the water may soak to the extremities of their roots. Merely wetting the surface, does as much harm as good, by causing it to bake and crack.

Cuttings.—What is commonly called a *cutting*, is a piece of the last year's wood, from one foot to eighteen or twenty inches in length, containing several buds, as seen in fig. 4. As soon as the ground is in good working order in the spring, the cuttings should be planted. Choose a rather sandy piece of ground, and stretch a line across it. Then dig a trench the depth and width of one spade, and carry this earth to the opposite end of the bed, to fill in with at finishing. Now dig across the bed again, throwing the earth up to the line, and make it level and smooth with the spade. Now set the spade perpendicular, and back up to the line and thrust it into the ground to the depth of two-thirds the length of the cutting. Then draw the spade towards the bed, and from the line, bringing with it the soil, and leaving a perpendicular bank immediately beneath the line. Now place the cuttings in an upright position against this bank, about six inches apart, and about two-thirds their length in the ground, leaving one or two buds above ground. Now place the loose soil up to the cuttings with the spade, and tread it up to them firmly with the foot, setting the foot only once in a place, and right across the row. Now dig it all level and smooth for a distance of fifteen or eighteen inches from the row, and move the line and make another. Should the ground be rather stiff or clayey, it will be well to put into the trench, immediately upon the heels of the cuttings, about two inches of light, sandy soil. This will induce them to root more easily. Decomposed vegetable mould and sand is best for this purpose, if they can be had. Should the weather prove hot and dry before the cuttings have rooted, it may be necessary to give them some water, or a shading with some light, littery straw, or both, as circumstances may suggest.

Fig. 4.

Layers. — Layering is the bringing down of a branch from an established plant, and burying in the soil while yet connected with the mother plant. Fig. 5 will fully illustrate this.

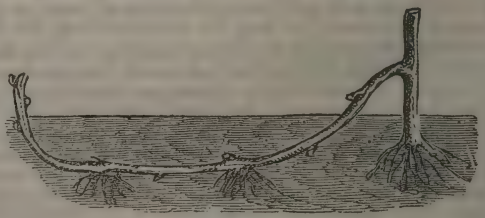


Fig. 5.

The best time for layering the grape vine, is in the latter part of June or beginning of July. Take a young branch, and bring it to the surface of the ground. Lay it where it is wanted, and peg it there, if need be. Then cover it with light, rich soil to the depth of three inches, and the whole length of the branch, leaving the end and all the leaves and small laterals sticking out. By fall it will be well rooted all the way up the stem. It may then be taken up and divided into as many pieces as there are buds with roots to them, and each will make a plant.

Grafting, Budding and Inarching.—Although the grape vine may be multiplied by each of these methods, it is so much more readily propagated by eyes, cuttings and layers that the former methods are seldom resorted to. But it may sometimes happen that a person has an old stock of a poor variety, standing in a place where he desires it to remain, who wishes to cut it down and graft on it a better kind. If the grape vine be cut down and grafted early in the spring, or just before the buds begin to start, it is liable to bleed so profusely as to dislodge the scion. It is, therefore, better to wait until after it has begun to grow, and made shoots eight or ten inches long, and leaves as large as a silver dollar. It may then be cut down to within two inches of the ground, and the stump split with a chisel or large knife, and a scion of the desired variety pared down in the form of a wedge and inserted into the split in the stock, so that the bark of the scion will come in contact exactly with the bark of the stock, or a union will not take place. It must now be bound tightly round with waxed cloth, so as to exclude air and water, and then earth heaped around nearly to the top of the scion, leaving one or two of the buds out. Fig. 6 will illustrate it. If waxed cloth cannot be had, then bind the graft nicely over with basswood bark or worsted yarn, and cover the whole with a lump of wet clay, as large as a duck's egg.

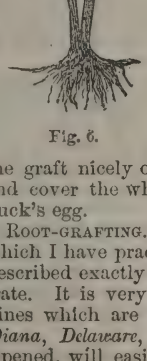


Fig. 6.

Root-grafting.—A very successful mode of root-grafting, which I have practiced for many years, and have never seen described exactly in any books, I will here endeavor to illustrate. It is very applicable to the multiplication of those vines which are difficult to root from single eyes, as the *Diana*, *Delaware*, &c., the smallest buds of which, if well ripened, will easily grow. Take a portion of the wood of a vine with one bud; cut one and a half inches below the bud, and half an inch above it; hold the scion between the thumb and fore finger of the left hand, with the bud uppermost, and pointing to the hand; place the knife at the heel of the scion, and draw it up in a slanting direction about one inch, to the centre of the pith; then turn the scion over, and make a similar cut one-quarter of an inch in length, taking the piece clean out of the

Fig. 7.

scion. Now take a piece of root, two inches long and of the same thickness as the scion, and cut off at an oblique angle; then pare the opposite side, so as to make it fit the wound in the scion. Put them together and bind with a piece of waxed cloth, and manage as recommended for single eyes. Fig. 7 will illustrate this. It is a modification of saddle grafting, and, if nicely fitted, brings a greater surface of the wound in the scion in contact with that of the root than by any other method; *a* is the scion, and *b* the root.

INARCHING and BUDDING will seldom or never be wanted for the propagation of the native varieties of the vine; therefore they are hardly worth describing here.

PLANTING.

There is a difference of opinion existing among planters as to whether cuttings, or one-year, two-year or three-year old rooted plants are the best. Those in favor of cuttings contend that they become rooted in their permanent place, where they are to grow, and that the mutilation of their bottom roots, consequent on removal, is thus avoided, which, if broken off, can never be supplied. The difficulty of getting proper cuttings, and the uncertainty of their all growing, in the Northern States, particularly with unpracticed hands, is almost a sufficient veto on planting with cuttings. In the Western and South-western States, where they have early, mild springs, and long, warm summers, cuttings may be more satisfactory; but in the Northern and North-eastern States, where the springs are late (having cold nights up to the first of June), and the summers hot and short, cuttings are not so sure.

A cutting, for planting at once in the vineyard, should be a portion of wood taken from the base of a cane of the first growth of the present season. It should be round, short-jointed, four or five buds in length, well ripened, and cut with a small portion of wood of two seasons' growth at its heel. Such cuttings, if properly managed, will rarely fail. But, few persons will like to cut their vines back so as to spoil the spurs, which should be saved for fruiting another year, for the sake of getting a few cuttings. Cuttings of the second growth, or of pithy, unripened wood, are unsuitable. What is wanted, is an early, healthy, vigorous and even growth, that the vines may become well established and well ripened the first year; and how can this be attained better than by one or two-year old, well-rooted and well-ripened, healthy plants?

If it be decided to plant with cuttings, as soon as the ground is in good working order, early in the spring, place the spade perpendicularly and back up to the little marking-stick where the vine is to stand. Then drive the spade into the ground to its full depth without disturbing the marking stick, and pull it forward, bringing with it a spadeful of earth. This leaves a little perpendicular bank, the width and depth of the spade. Now place two cuttings close up to the bank, two inches apart, one on each side of the marking-stick, and deep enough to leave one

bud half an inch above ground. Now fill the hole with nice, fine earth (decomposed leaf-mould from the woods, with one-fourth clean, sharp lake or river sand, is the best that can be had for the purpose of planting either the cuttings or plants in), press it firmly up to the cuttings, and make it smooth on top. Give one good soaking with water, to settle the earth to the cuttings. As soon as bright, sunny days begin to set in, it will be better to shade the cuttings by sprinkling over them a few loose straws, short grass or hay, to protect them from the scorching rays of the sun. Should there be continued hot, dry weather, they may require a second or third watering; but when watered, give them a good soaking, that will soak to their very bottoms.

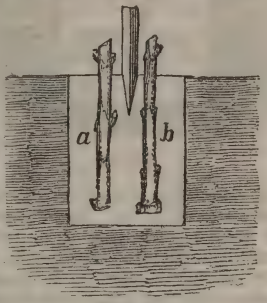


Fig. 8.

Fig. 8 represents the cuttings as they appear when placed up to the little bank left by the spade; *a* shows an imperfect cutting, made from pithy and unripened wood; *b* is a good cutting, made with well-ripened, solid wood, with a piece of two-year old wood at its base. There should always be two cuttings planted at a stake. If both grow, one must be cut away, or carefully taken away without injury to its roots, for the purpose of filling up any place where both may have died.

If good, healthy, one or two-year old ready-rooted vines are used, there will be one year saved, at least, with the additional advantage of having them *all grow alike* all over the vineyard. But as the rooted vines cost more money than the cuttings, some may object to the extra expense, and think it preferable to purchase the cuttings, and either plant them at once in the vineyard, as advised, or in a nursery-bed, and prepare their own plants a year beforehand. So it would be, if the planter were *sure* that all his cuttings would grow; but as it is very difficult some seasons, for an unpracticed hand, to make cuttings grow, I do not think, taking into consideration the vexation of losing some of the cuttings, and the loss of time, there would be much saved. If plants are chosen, there are none better (perhaps none so good) than one or two-year old plants, grown from single eyes. Their roots all issue from one base, and can be more readily spread out and nicely planted at one depth, and in less time, than those grown from layers or cuttings, whose roots issue all the way up the stem. And they would seem preferable, too, from their whole force and energy being concentrated in one bud from the beginning, to those whose substance is divided among several, as in cuttings from the nursery-bed. But as the native varieties are more commonly propagated by cuttings or layers, it may be difficult to get them from eyes; and in that case, the former will require a little more care in pruning and planting, and may ultimately be just as good. Before planting, the vines must all be

carefully examined; and if there be any mutilated roots, they must be carefully cut away with a sharp knife, and trimmed and pruned back to the lowest good, plump, round bud above their *upper* roots; and those from eyes, to about *eight inches* above their roots. While this is being done, care must be taken that the roots are kept moist, by shading with wet cloths or straw, and watering, &c.; for if allowed to dry and shrivel, they will start unevenly, and some of them may die altogether — but if carefully managed, there is no occasion to lose one of them. When ready for planting, prepare, with a spade, all the holes first — if for plants from layers or cuttings, about a foot square and a foot deep, and if for those from single eyes, a foot square and eight inches deep.

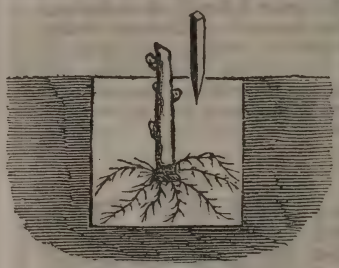


Fig. 9.

Make the holes square up to the stake, so that the plant may stand right in front of it. Lay the soil out of the hole on one side of it, and on the other side about two shovelsful of nice earth, as recommended for planting cuttings in. When all is ready for planting, take a few plants at a time, to be exposed to the sun and wind, and begin at one corner and plant one whole row first, and then another, to avoid trampling as much as possible. Put about two inches of the compost into the bottom of the hole; spread it level, and set in the plant; spread its roots out in their natural position, as near as may be; then fill in the rest of the compost, pressing and shaking it beneath and between the roots as much as possible; then fill the hole up level, leaving one bud just above the surface. When planted, give one good watering; and shade as advised for cuttings, if hot, dry weather.

Fig. 9 represents a plant grown from a single eye, with the roots all at its base; and fig. 10 a plant grown from a cutting or layer, with its roots all up the stem.

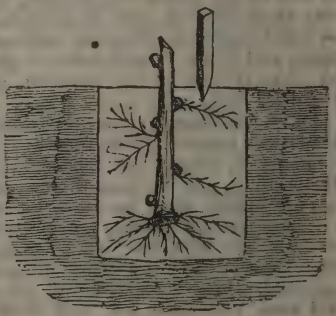


Fig. 10.

The marking-sticks should be left in their places the first year, as a guide and protection to the young and tender vine; for the buds are so brittle when first starting to grow, that the least touch may break them off.

All that remains to be done, is to keep all kinds of animals out of

the vineyard, and to avoid tramping and walking about as much as possible. Let the vines be stirred two or three times during the summer with the cultivator or hoe, to keep down all weeds, &c. The vines may be allowed to grow at will during the first summer; very few will ever get broken by the wind, &c. After they have grown a foot or so, and are lying on the ground, they should be trained to one cane, and the small laterals produced on the main cane should be pinched back to one leaf.

TREATMENT OF THE VINES THE SECOND YEAR

In mild seasons, the month of February will be the best time to prune; but if very severe weather, it had better be deferred until it becomes a little milder. But when put off too late, the vines are apt to bleed a great deal; and although the bleeding may not be so injurious as many persons suppose, it cannot do any good, and may as well be avoided as much as possible. In pruning this year, the vines must be cut down to the lowest good, round, plump bud, within two to four inches of the ground, as represented in fig. 11. Set the edge of the knife at the back of the bud, and at one inch above it, and take it off at one clean cut.

Fig. 11.

If the vineyard has been planted with cuttings, two at a stake, wherever both have grown one will have to be taken away — either cut away with a knife, or carefully dug away without injury to the one left. Always leave the best vine; and those which are taken up will do to fill vacancies where both may have died. Many persons perform this operation in the month of October; but as we sometimes have very severe winters, I think it had better be deferred till spring, to avoid winter heaving of the newly-planted vines. It should, however, be performed as early in the spring as the soil and weather will admit — when the ground is in good working order, but not in very wet, or cold, windy or frosty weather.

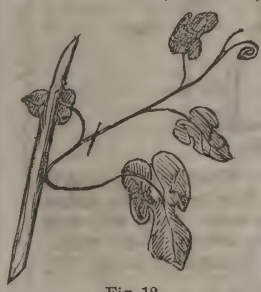


Fig. 12.

As soon as the weeds begin to grow, the soil will want stirring, either with the cultivator or hoe, so as to kill the weeds, and stir the soil around the plants. This operation should be repeated as soon as the weeds begin to show themselves again. When the weather begins to set in hot and dry, if a little mulching of littery manure, or short grass, leaves, or anything that will keep the ground partially shaded and moist, be applied around the young vine, it will be of great service.

The vines may be allowed to grow at will this summer, without stakes, and trained to one cane. During the summer, small lateral shoots will

be produced from the axle of each large leaf on the main cane, which must be cut back to one leaf when it has grown two or three leaves in length. The object of this is to concentrate the sap in the main cane, instead of its being wasted in the laterals, that it may be as strong and well-ripened as possible.

Fig. 12 shows a section of the main cane, and the small line on the lateral where it is to be cut off.

TREATMENT OF THE VINES THE THIRD YEAR.

In February of the third year, the vines are again pruned down to the lowest good bud, within four or six inches of the ground, as represented in fig. 13. If the vineyard has been planted with rooted plants, a few grapes may be had this year, but not more than two or three bunches to a vine; but if it has been made with cuttings, no fruit may be allowed until the fourth year.

Fig. 13.

The vines must now be supplied with stakes, and preparations made for whatever mode of training is to be adopted. Some planters train their vines to one stake, some to two, others to three, and others again to four. Where only one stake is used — which, perhaps, is the best, where vines are planted only four feet apart each way — the stake is set immediately at the head of the vine, and on the north side of it, as in fig. 14. Where two stakes are

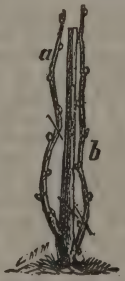


Fig. 14.

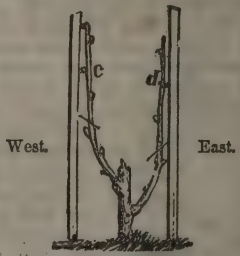


Fig. 15.

used, they are set out as represented in fig. 15. Where the ground is strong, and the vines planted five feet apart, or four by five, the stakes should be set one foot from the vine, east and west. They will then cast less shade early in the morning than when set north and south. Where three stakes are used, they are set as represented in fig. 16; where four are used, as represented in fig. 17.

Where one stake is used, only two canes must be allowed to grow this (the third) summer, which will, at the end of the season, look like fig. 14; if two stakes be adopted, like fig. 15.

The summer pruning will consist in rubbing out all surperfluous shoots, pinching in the laterals, as in fig. 12, and keeping the canes

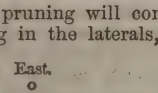


Fig. 16.

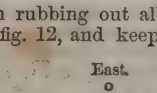


Fig. 17.

carefully tied to the stakes. It is a good practice to pinch in the leading cane when it has grown four feet in length, or when it begins to turn brown at the bottom. This throws back the sap into the lower buds, and strengthens and assists their swelling and ripening for bearing fruit the next year. Keep the vineyard nicely cultivated and all clear of weeds, and avoid all unnecessary walking and trampling about.

TREATMENT OF THE VINES THE FOURTH YEAR.

This season the vines will be in good bearing condition, and must be pruned accordingly. It is best, however, not to train them to bows until the fifth year, as they would be likely to show more fruit than the vine could sustain without exhausting it too much for the year following. In February of this season, cane *a*, in fig. 14, is cut back to the small line drawn across it, leaving it about four or five buds, or twelve to fifteen inches, in length. From the buds on this spur, the fruit-bearing shoots will be produced. Cane *b* is cut down to the lowest good bud; the small line drawn across it indicates the place where it is to be cut.

During the present summer, while the spur *a* is bearing fruit, a spur from cane *b* is trained up for fruiting in the year following — say in 1858, for fruiting in 1859. In fig. 15, the canes *c* and *d* are cut down to three or four buds, or eight or ten inches. in length, that the two together may not bear much more fruit this season than the longer one in fig. 14.

During this summer, two canes are taken up from each spur, in fig. 15, and allowed to bear fruit. The cane starting from the upper bud is to form the bow for fruiting in the fifth season; and the other is to cut back to form a spur, from which a cane is taken during the fifth season to form the bow for fruiting during the sixth season. This is called the renewal system, and is the one generally approved of. The bearing cane is cut down annually after having borne fruit, and its place is annually supplied with a new cane.

In the fall of the fourth year, the vine will have the appearance of fig. 18; and in the spring of the fifth year, after being trimmed and tied to the stakes, that of fig. 19. The two small branches, *a*, *a*, below the spurs, in fig. 18, must be pruned back to where the line indicates; but a new shoot must be carefully preserved from year to year, in case

of accident to either of the other canes. The bow should be from five to eight buds in length, according to the strength of the vine. Great care and nice judgment are required in bending the bows. They should be made in the mornings, and in cloudy, moist weather; for when the wood is very dry it is more brittle. The bows should be as round as possible, and all sharp bends carefully avoided, to prevent fracturing

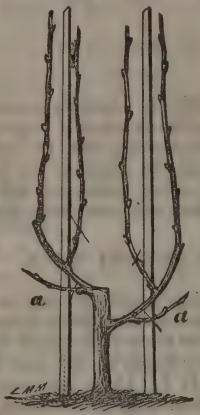


Fig. 18.

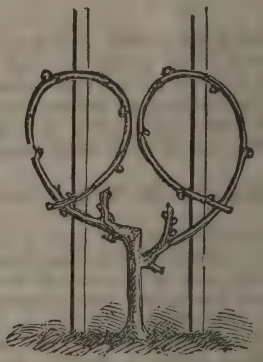


Fig. 19.

the canes, as, without this caution, much injury may be done. The object of making the bows, is to equalize the flow of sap in all the buds, that the lower buds may start with equal vigor with the upper ones; otherwise, if the canes were left straight, the whole force of the sap would be driven into the upper buds, to the great detriment of those upon the lower part of the cane.

Summer Treatment.—The summer treatment of the vines will consist in carefully securing the young shoots when they are about a foot in length. The junction of the young and old wood is so very weak just at this time, that, if not secured, any sudden storm may cause great injury, by breaking them off. Wherever more than one shoot starts from one bud, all superfluous shoots must be rubbed off, leaving but one shoot, and that the best. When the shoots are all carefully secured, they must be pinched back to two leaves above the highest bunch of grapes; and all the small laterals produced upon these shoots, as well as upon the future cane, for fruiting next year, must be pinched in to one leaf; and this future fruiting cane may be stopped, by pinching out its leader, when it has grown four feet in length, or when it begins to turn brown at the bottom.

This summer pinching, if judiciously performed, is of great benefit

to the vines. It throws back the sap into the young and swelling fruit and the lower part of the vine, instead of its being expended in weak and straggling branches. There is still foliage enough left to shade the fruit, and to elaborate the sap round about the bunches, keep the vine in health, and thoroughly ripen its wood. My practice is to leave two leaves above the bunch, where the leaves are large and healthy; and three or four, where small and weak; for I have always observed that one good, broad and healthy leaf is worth more in ripening up a cluster of grapes than half a dozen small and weakly ones.

SETTING THE STAKES.—The stakes should be of some good, lasting wood, such as oak, ash, hickory, cedar, chestnut, &c. They should be about two inches thick, and five feet six inches long, to be driven eighteen inches in the ground, which will leave four feet out. The best way of setting them, is to punch a hole with a round, sharp-pointed crowbar, of about the thickness of the stake; set the stake in the hole, and drive it home with a mallet. Be careful that they are set in their exact places, and upright, that they may come in perfectly straight rows every way.

Every spring the stakes must be examined, to see that they are sound, and not heaved out of place by the winter's freezing. If any are found to be rotten, they must be replaced by new ones, or reversed, the sound end being put in the ground. In France, about Fontainebleau, the vines are pruned in the fall, and all the stakes are pulled up and carried under cover, or piled in little stacks in the vineyard, and re-set in the spring. They stick a few stakes in the ground, something in the form of a sawbuck, and then pile a number of stakes on in the position that a stick of wood is placed to be sawed; but I forget how to describe it exactly. This must preserve them much longer than if they were left in the ground altogether. In France, the tying is usually done with a small white rush; in this country, with a willow twig, which is twisted rather than tied. The small yellow willow is the best, and it is well to have a small patch of them growing for the use of every vineyard. Fifty plants, when three years old, will produce ties enough for an acre of vines. They should be planted in any wet soil, four feet apart each way, and headed down every spring.

The foregoing remarks are more applicable to the culture of the *Catawba* grape in the Western States; but it is a very precarious grape in New York State. On the other hand, the *Isabella* has been found not to do so well in the Western States as the *Catawba*, or when stubbed down every year to a mere stump, as is necessary when trained to one stake three or four feet high; but it is remarkably well adapted to the State of New York, and for trellis training.

I will here give one or two cuts of trellis training, well suited to the *Isabella*, which are remarkable for their simplicity. The preparation of the ground, and the treatment of the vines, for the first two years, are the same as recommended above. The vines are planted ten feet apart

in the rows, and the rows six feet apart, running east and west. In the spring of the third year, the vine is cut dow to eight or ten inches in height, the posts are set midway between the vines, and the wires fixed. During the summer, two canes are trained up across the wires, and let grow to their full length, the laterals being pinched out during the summer, as previously recommended. At the winter pruning of the fourth year, the canes are cut to five feet in length, and tied down horizontally to the bottom wire, as in fig. 20. During the summer, shoots must be trained from these horizontal canes, at fifteen to eighteen inches apart, and carried up perpendicularly and carefully secured to the wires. These shoots will all show fruit, and cane *b* may be allowed to bear. When it has grown seven or eight leaves in length, it must be pinched in to two or three leaves above the highest bunch. Cane *a* must have all its fruit cut off, and be allowed to grow to its full length, or one or two feet above the highest wire, when it may be stopped. In the spring of the fifth year, cane *b* is cut out to the lowest good bud, and cane *a* is cut back to the highest wire. This summer, cane *a* is allowed to bear fruit, as indicated, and cane *b* at the same time is trained up from the spur. In the spring of the sixth year, cane *a* is cut out to the line drawn across it, and a new cane trained up from its spur while cane *b* is bearing fruit. Thus, no cane is ever allowed to bear twice; new wood is supplied every year for bearing the next, which

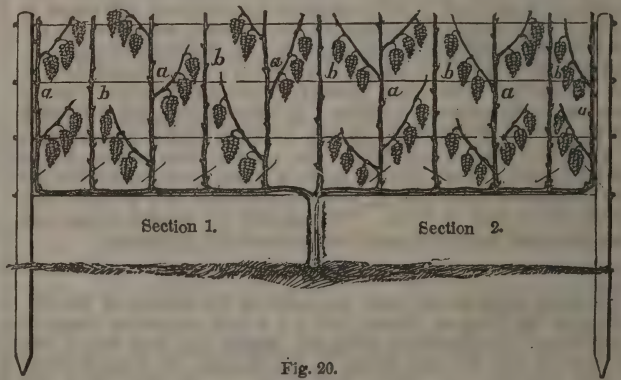


Fig. 20.

always gives the finest fruit. Section 1, in fig. 20, shows one mode of trimming the canes, and Section 2 another. Section 1 is more applicable to a higher trellis — say six or seven feet — while Section 2 is only adapted to about five feet, from its being more heavily cropped. The trellis represented is only four feet high from the ground, with bearing canes three feet in length. These can very easily be carried one or two feet higher.

Fig. 21 shows another mode of training, the principle of which is the same as the preceding, with the advantage of the vine being more slowly and regularly increased, and without the necessity of such a great bulk of the vine having to be cut away every year. In the former method, all the largest canes have to be cut away every year; while in this, we cut away only the small wood, and the great bulk of the vine remains. The mode of training is readily seen from the cut.

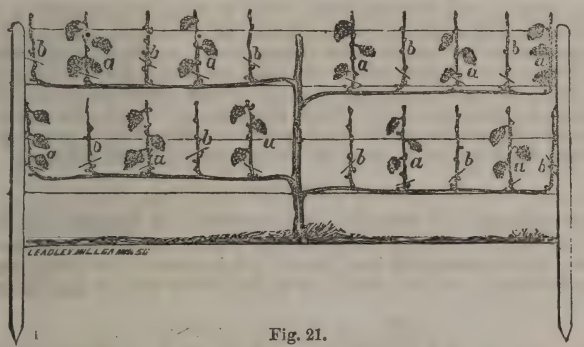


Fig. 21.

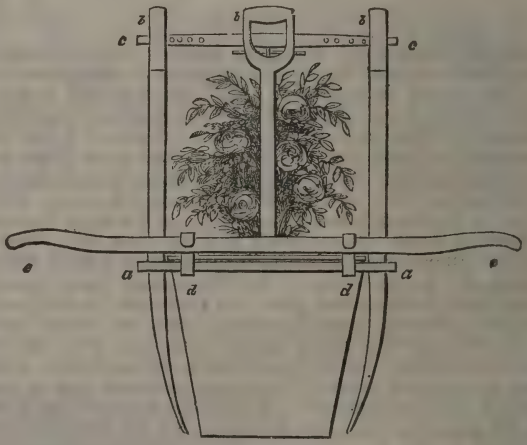
In the summer of the third year from planting, two horizontal canes are trained to the bottom wire, and one straight up the middle. In the spring of the fourth season, the upright cane is pruned down to two feet above the horizontal canes. When the vines have begun to grow, and it is sure the three upper buds are safe and secured to the wires — two horizontal and one upright — the other buds lower down the centre cane are rubbed out. The two lower canes are pruned back to five feet in length, the width of the trellis. During this season, while the second tier of horizontal canes are growing, the lower are throwing up shoots (marked *a*, *b*). These shoots will all show fruit; and those marked *a* are allowed to bear, while those marked *b* must have their fruit all cut off. In the winter of the fifth season, these shoots, *a*, *b*, are pruned down to the lowest good bud (indicated by the line drawn across them). The two upper horizontal canes are pruned in to five feet, or the width of the trellis, as the lower ones were last season. This (the fifth) season, the shoot from spur *b* is allowed to bear, while that from spur *a* is allowed to rest. Thus, each alternate spur is made to bear and rest each alternate year. If this vine be carried up three tiers high, it will then be about seven feet high from the ground to the top, which is high enough for any man to stand on the ground and work at.

I have no doubt that these modes of training may seem a little tedious to the uninitiated, but, when understood, they are as simple as any other; and no one who cannot exercise judgment, care and skill, has any business in a vineyard. It may be an objection that wire trel-

lises will be too expensive to warrant their erection. They may be more expensive, in the first instance, than staking out the vineyard with stakes, but, in the end, they will be the cheapest. The annual attention required in re-fastening the stakes, and taking out bad ones and supplying their places with new ones, will soon add up to the cost of the wire trellis; and the trellis, if well set, will last a great many years.

The French, near Fontainebleau, have a cheap way of making very good and durable trellises, for the raising of table grapes upon. They set posts of locust, about three or four inches in diameter, two feet in the ground and six out, and about eight or ten feet apart. They then tie across the posts strips of white oak or ash, about one inch thick and ten or twelve feet long. These strips are split out in the same way that we split out hoops for flour barrels. They are tied to the posts with annealed iron wire, which is bound round and twisted tight.

The principle of McGlashan's apparatus for transplanting trees without disturbing their roots, will be understood from the annexed figure; *a* is a rectangular iron frame; *b*, *b*, *b*, spades to be forced nearly perpendicularly into the soil; *c*, *c*, an extension rod so applied as to



force the spades outward by the leverage at *e* acting upon the fulcrum, *a*. The result is that the earth between the blades is pressed into a wedge. The whole is then lifted by the handles, *e*, *e*, attached by hooks, *d*, to the frame.

RURAL ARCHITECTURE.

WRITTEN FOR THE RURAL ANNUAL BY J. F. FORSYTH, ROCHESTER, N. Y.

OF all branches of Rural Husbandry, there is none that requires the attention of farmers more than that of Architecture. Generally, the greater part of our lives is spent at our homes, and it is, therefore, highly desirable that they should be made convenient and agreeable. This can be done at a far less cost than is generally supposed. The cottage may possess these requirements as well as more pretensious buildings, but, of course, not to so great an extent. In a short article like this, we have not space to discuss the merits and peculiarities of the different styles of architecture. We shall only give a few practical, general hints on building, before describing the accompanying designs, which, we think, are adapted to the wants of the generality of the farmers of this country.

Cellars should never be less than seven feet between the floor and ceiling. The general mode of construction, is to dig the cellar about five feet six inches deep, and build the walls seven feet high, leaving nearly two feet of the walls above the ground on the outside. This will give ample space for the windows — of which there should be plenty — to light and ventilate it well.

The best floors for protection against dampness that we have seen, are of a composition made of water-lime and good, sharp, clean sand — about two parts of lime to one of sand. First spread over the ground, about five or six inches deep, broken bricks, small stones, old mortar, &c., taking care to have the centre of the floor the highest. Then spread on the mortar about an inch thick, and let it harden for a few days, and it will make a durable, waterproof floor.

It is necessary that a cellar should be well drained. This can be done with draining tile as cheap, and perhaps as well, as with any other material.

The first story of a house should never be less than eight feet high, nor the chamber floor less than seven feet. A house can never be comfortable with lower ceilings. It is necessary that all the rooms should be well ventilated. This can be effected by means of flues in the chimneys, ventilating stoves, &c. Perhaps the cheapest way is to construct separate flues in the chimney for the purpose. There should be apertures in the wall of the rooms, near the ceiling, opening into

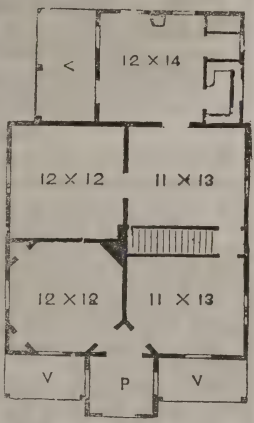
No. 1. Farm Cottage.

the flues, which will allow the impure air to pass off. Generally, sufficient air will be supplied from the crevices around the windows and doors.

There are no outside blinds represented in the accompanying engravings. It costs but little more to have inside shutters, and they are far superior to the ordinary blinds — never being clogged with snow or ice, and, when closed, are an effectual screen against the eyes of all outsiders.

A building made of wood should never be painted to resemble brick, stone, or any other material; for it is almost impossible to get an exact resemblance, and, where the deception is imperfect, it looks worse than if left even unpainted. A light-drab, gray or straw color, for cottages, is preferable to white, which causes it to appear distinct from the surrounding scenery, while it should be made to harmonize with it.

No. 1 is a small farm cottage, designed for a small family with only one servant. It is entered by means of an enclosed porch, which opens into a small triangular hall communicating with an octagon parlor (12 feet by 12) and a living room (11 feet by 13). Back of the parlor is a bed room (12 feet by 13), which opens into the dining room (11 feet by 13). The kitchen (12 feet by 14), pantry and milk room are built in a separate wing, one story high. There is a veranda on the kitchen front, which may be partly enclosed in winter for the storage of wood, &c.



No. 1. Ground Plan.

The chamber floor contains two bed rooms, each 10 feet by 12, with separate closets.

The house is built of matched boards, battened at the joints, and filled in with bricks set edgewise. Cost estimated at $650.

The old maxim that "you cannot make a silk purse out of a sow's ear," contains a good and true moral, however inelegantly it may be expressed; and its meaning should be well considered by those who are about building cottages. We have seen cottages, copies of some larger building whose style has, perhaps, struck the fancy of the builder, and which, though perhaps very appropriate in the building copied from, appears very ridiculous when reduced to a small scale. A cottage should always have a modest and quiet appearance, and it appears ridiculous in one to try and make it have the appearance of a large mansion. Cottages may express as much elegance and refinement as larger buildings; but it is foolish to attempt to make them express the same grandeur, and it should never be attempted.

No. 2. English Farm House.

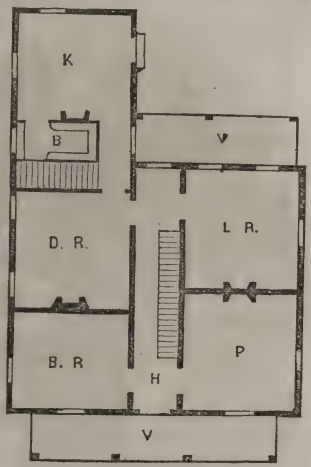
In our opinion, there is no style of dwelling so suitable for farm houses as the English Rural, represented in No. 2. The truncated gables give it a sheltered appearance, that is always pleasing, besides giving variety to the outline. The small gable in front relieves the house of the low appearance it would otherwise have, and also gives place for an additional window to light the attic. The broad veranda is a cool place to rest in the summer after the day's toils are over, and its roof protects the doorway from the rains of the spring and fall, and the snows of winter. There is no light finishing about it — everything is plain and substantial, and its general appearance bespeaks the comfort of its occupant.

This house may be built of either brick, stone or wood. We should prefer stone, as being the most substantial, and, in our opinion, the most suitable for the style; although either wood or brick would answer very well. If built of wood, it should be clap-boarded, and the window-caps, sills, &c., should be made plain and heavy.

The house is intended to face west, and is suitable for a situation in a level or gently undulating country.

The ground plan contains a hall, parlor, living room, dining room, bedroom, kitchen and pantry. The kitchen is in a separate wing, one story high, back of the main body of the house. It is the custom of some American farmers to eat their meals in the kitchen. This, we think, shows a want of refinement, and should always be avoided. The dining room of this house is almost immediately connected with the

kitchen, so that it it is very little, if any, more trouble to set the table there. The inside entrance to the cellar is through the pantry. There should also be one of larger dimensions from the outside, so that vegetables and roots generally stored there will not have to be taken through the kitchen.

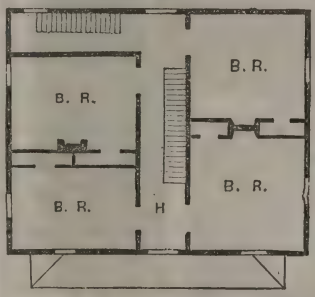


No. 2. Ground Plan.

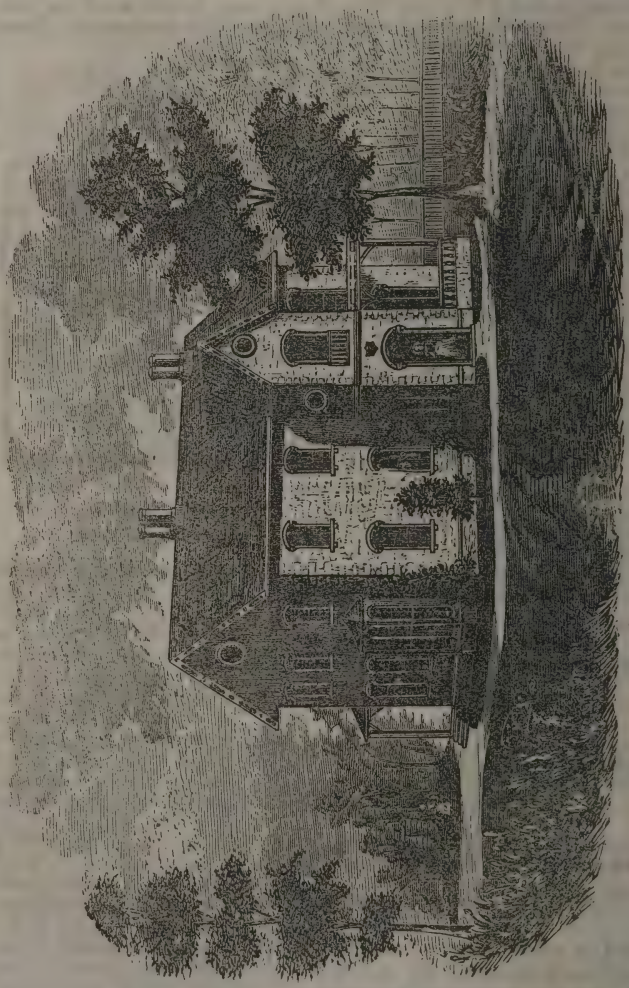
The chamber floor has four large bed rooms, amply supplied with closets. The stairs leading to the attic are over those in the back part. The attic may be finished for chambers, or left for a store room.

The cost of building would range, if of wood, from $1,500 to $2,000; if of brick, from $2,000 to $2,500; if of stone, from $1,500 to $1,800, according to the quality of material, &c.

No. 3 is a suburban residence or country house, designed for the wealthier class of farmers. It should be built of stone, or brick with stone dressings for the corners, window-caps, sills, &c. An open porch (fitted with seats) communicates with a spacious hall, 10 feet by 30. This hall contains the principal stairs; and it communicates with all the rooms of the ground floor, with the exception of the kitchen. We think it best not to have a direct communication with this room, as the steam and smoke caused by cooking is liable to escape into the hall, and from thence through the house. On the left of this hall is a spacious drawing room, 15 feet by 20, lighted by a large bow window on the end, and two windows in front. Back of this, and on the same side of the hall, is a large bed room, 14 feet by 15, with a large closet and bath room. Many persons object to bed rooms on the ground floor, as being unhealthy; and if this room should not be desired as a bed room, by omitting the closets a very pleasant living room could be made. On the right of the hall is the library, 12 feet by 15, which is designed to be used as the general sitting room of the



No. 2. Chamber Floor.

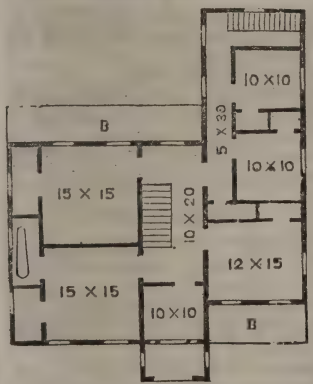


No. 3. Suburban Residence or Country House.

family, as it is one of the pleasantest rooms in the house — opening on a veranda in front, and having a bow window in the end, which gives the room a much pleasanter appearance than it would otherwise have, and affords an excellent place for reading or sewing. By an error in the engraving of the perspective, the library front is made to appear as if under the same roof as the drawing room hall, &c.; but, by an examination of the ground plan, it will be seen that the library front stands several feet back of the main front, and the veranda only extends as far as the main front. Back of the library is the dining room, 15 feet by 15, lighted by two large windows. Back of the dining room is the kitchen and pantry. The back stairs also communicate with this room, and under them are the stairs leading to the cellar. The kitchen is lighted by four windows, of good size, affording plenty of light.

No. 3. Ground Plan.

The chamber floor contains a large hall, 10 feet by 20, which communicates directly with the principal rooms. On the left of the hall are two bed rooms, each 15 feet by 15, supplied with closets. The one over the drawing room has also a bath room. In front of the hall is a small bed room, or *boudoir*, opening into an enclosed balcony in front. On the right of the hall, over the library, is a bed room, 12 feet by 15, with a balcony over the veranda in front, closet, &c. Also, communicating with this hall is a back passage, 5 feet by 30, which gives access to two small bed rooms, 10 feet by 10, each provided with closets. At one end of this passage is a linen closet. At the back end are the back stairs; over which are the stairs which lead to the attic, which is designed to be left unfinished as a store room. Cost estimated at $4,000.



No. 3. Chamber Floor.

LIST OF AGRICULTURAL IMPLEMENT MAKERS

IN THE UNITED STATES AND CANADA.

MAINE.

Hanson, J. W., Unity.

MASSACHUSETTS.

Allen & McElwain, Springfield.
Blake, Barnard & Co., Boston.
Breck, Joseph, & Son, Boston.
Hovey, Haskill & Briggs, Springfield.
Nourse, Mason & Co., Boston.
Nourse & Co., Boston.
Parker, White & Garrette, Boston.
Reed & Pierson, Pittsfield.
Treadwell & Co., Boston, and San Francisco, Cal.

CONNECTICUT.

Johnson, William B., New Haven.
Pang Manufacturing Co., Northfield.
Royce, J., Hartford.
Way, George M., Hartford.

NEW YORK.

Allen, R. L., 189 and 191 Water street, New York.
Am. Mowing and Reaping Machine Co., Buffalo.
Ball, L. C., Hoosic Falls.
Burrall, T. D., Geneva.
Chaney, A., & Co., Ogdensburg.
Cooley, John S., & Co., Canandaigua.
Cooley, J. S., & Co., Oswego.
Deering & Dickson, Albany.
Emery Brothers, 52 State st., Albany.
Foster, E. J., Syracuse.
Foster, Thomas, Utica.
Grant, J. T., & Co., Junction.
Griffing, Brother & Co., 60 Cortlandt st., New York.
Gordon, A., & Co., Rochester.
Grant, Viall & Nutting, Troy.
Hall, Joseph, Rochester.
Howard & Co., Buffalo.
Hallock, E. D., Rochester.
Hildreth & Charles, Lockport.
Lamson, Goodnow & Co., 79 Beekman st., New York.
Mayher, George W., 197 Water st., New York.
Moore, S. M., Champlain.
Pease, R. H., Albany.
Pitts, J. A., Buffalo.
Pratt & Brother, Canandaigua.
SEYMOUR, C. H., East Bloomfield.*
Seymour, Morgan & Co., Brockport.
Smith, Tracy & Co., Newark.
Tredwell & Jones, 251 Pearl st., New York.
Warren, Henry, Troy.
Westinghouse & Co., Schenectady.
Wheeler, Melick & Co., Albany,
Wheeler, W. A., Oswego.
Wood, Walter A., Hoosick Falls.
Wright, P. D., Rochester.

PENNSYLVANIA.

Breck & Co., Philadelphia.
Cooper, Lewis, Christiana.
Eagle Works, Harrisburg.
Landreth, D., Philadelphia.
Paschal, Morris & Co., Philadelphia.
Rogers, C. B., Philadelphia.
Scott, Ross & Co., Philadelphia.
Spangler, A. M., & Co., Philadel'a.

* See Advertisements.

Wardrop, Stout & Williams, Pittsburgh.
Welles, R. M., Athens.

DISTRICT OF COLUMBIA.

Coyle, Fitzhugh, Washington.

MARYLAND.

Drury, H., Baltimore.
Hussey, O., Baltimore.
Montgomery & Brother, Baltimore.
Robbins & Bibb, Baltimore.
Rice & Norris, Baltimore.
Sinclair, R., Jr., & Co., Baltimore.
Whitman, E., & Co., Baltimore.

VIRGINIA.

Baldwin, Cardwell & Co., Richmond.
Cochrane, Samuel S., Petersburgh.
Palmer, Wm., & Son, Richmond.
Rowlett J., & Co., Petersburgh.
Zimmerman & Co., Charlestown.

GEORGIA.

Carmichael & Bean, Augusta.

KENTUCKY.

Avery, B. F., Louisville.
Brent, H. T. & J. C., Paris.
Brinley, T. E. C., Simpsonville.
Foulds & Prague, Covington.
Howard, H. B., Louisville.
Miller, Wingate & Co., Louisville.
Munn & Co., Louisville.
Peter & Buchanan, Louisville.
Pitkin Brothers, Louisville.

TENNESSEE.

Loundes, Orgill & Co., Memphis.
McAllister, J. A., Nashville.
Richardson, R. G., Franklin.
Van Epps, A. C., Chattanooga.
Walker, J. H. & W. W., Knoxville.
Weller, B. S., Nashville.

LOUISIANA.

Sizer, George W., New Orleans.

OHIO.

Ball, Aultman & Co., Canton.
Baldwin, De Witt & Co., Cleveland.
Dair, John F., & Co., Cincinnati.
Douglass & Co., Zanesville.
Gill, Wm. A., Columbus.
Jenkins, Wm. B., Painsville.
Lathrop & Joyce, Cincinnati.
Mansfield & Whiting, Ashland.
Minturn & Co., Urbana.
Owens, Lane & Dyer, Hamilton.
Raymond, Roberts & Co., Cincinnati.
Scott & Hedges, Cincinnati.
Warder, Brokaw & Child, Springfield.

MICHIGAN.

Brown, William, Battle Creek.
Burnham & Co., Battle Creek.
Flower, T. A., Pontiac.
Robinson & Woods, Kalamazoo.
Rogers, Moses, Ann Arbor.
Smith, A., & Son, Birmingham.

INDIANA.

Andrews, William Y., Mishawaka.
Beard & Sinex, Indianapolis.
Gordon, Castle & Gordon, New Albany.
Platt, Martin & Gordon, Salem.

ILLINOIS.

Alexander & Boyahin, Decatur.
Battell, Woodruff & Boyd, Quincy.
Danford & Co., Geneva.
Emery, H. D. & Co., Chicago.
McCormick, C. H., Chicago.
Manny & Co., Rockford.
Rentchler, J. B., Bellville.
Roberts & Co., Bellville.
Stockey, D., Bloomington.
Taber & Nettleton, Decatur.
Wright, J. S., Chicago.

WISCONSIN.

Barrows, Eldred & Co., Janesville.

MISSOURI.

Chadwick, James B., St. Louis.
Kingsland & Furguson, St. Louis.
Plant, Wm., & Co., St. Louis.
Sigerson, Jno., & Bro., St. Louis.

IOWA.

Doolittle & Chamberlain, Dubuque.
Gray & Rea, Fairfield.
Rentchler & O'Daniels, Mt. Pleasant.

CALIFORNIA.

McNally, H., San Francisco.
Palmer, L. L., & Co., San Francisco.
Shaw, Thos. Ogg, San Francisco.
Treadwell & Co., San Francisco, and Boston, Mass.

TEXAS.

Williams, I. G., Galveston.

CANADA WEST.

Barr, James, Norwich.
Massey, H. A., Newcastle.
Ridout Brothers, Toronto.
Walton, J., & Co., Holland Landing.
Walton, J. P. & B. S., Hamilton.

LIST OF NURSERYMEN

IN THE UNITED STATES AND CANADA.

MAINE.

Adams, John W., Portland.
Little, H., & Co, Bangor.

NEW HAMPSHIRE.

Pinneo, Joseph, Hanover.

VERMONT.

Palmer, Michael F., St. Albans.
Robinson ——, Ferrisburgh.

MASSACHUSETTS.

Anthony & McAfee, New Bedford.
Bliss, B. K., Springfield.
Branneman & Co., Florence.
Brewer, D. C., Springfield.
Capron, W. C, Uxbridge.
Clement, Asa, Dracut.
Colton, S. H., Worcester.
Evans & Co., Boston.
HOVEY & CO., Boston.*
Lincoln, D. W., Worcester.
Manning, R., Salem.
Moore, R. E., Springfield.
SNOW, DEXTER, Verbena Florist, Chicopee.*
Stone, J. C., Shrewsbury.
Strong, W. C., Brighton.
Walker, S., Boston.
WATSON, B. M., Plymouth.*

CONNECTICUT.

Affleck, George, Hartford.
Affleck, Henry, Hartford.
Austin, T. C., Suffield.
Hoyt, Stephen, & Sons, New Haven.
Lincoln, Henry, Scotland.
Lyman, Sol., Manchester.
Mason, Charles S., & Co., Hartford.
Newbury, Edwin, Brookline.
Paris & Dyer, Brookline.
Ramsdell, H. S., Thompson.
Seymour, Geo., & Co., South Norwalk.
Steel, P., & Son, Hartford.
Trobridge, F., New Haven.
Whiting, Alfred, Hartford.
Whiting, E. A., Hartford.
Whitmore & Co., Hartford.
Vitch, Robert, New Haven.

* See Advertisements.

NEW YORK.

Ainsworth, S. H., Bloomfield.
Allen & Teline, Oswego.
Bailey, John W., Plattsburgh.
Barnes, Phelps, & Putnam, Syracuse.
Battey, J., Keeseville.
Becker, H., Watertown.
BISSELL, C. P., Rochester.*
Boardman, Silas, Brighton (near Rochester).
Boyce, F. W., Utica.
Bostwick, H. H. & J. H., Auburn.
Bridgeman, Alfred, Broadway, N. Y., Astoria, L. I.
Brocksbank, W., Hudson.
Brooksby, Alexander, Hudson.
Brinkerhoff, D., Fishkill Landing.
Buchanan, Isaac, New York.
Burr, Zera, Fairport.
Burtis, Lewis, Rochester.
Caldwell, Joseph, Troy.
CARPENTER, S. P., New Rochelle.*
Colby, Z., Sweden.
Collins & Chase, Auburn.
Cook, William H., Pittsford
Covey, Alvah, Penfield.
Corning, J. H., Kinderhook.
Cullin, William, Auburn.
DONNELLAN, J., & CO., Hanford's Landing.*
Doran, C., 31st street, New York.
Drake & Britton, Elba.
Dubois, C., Fishkill Landing.
Duquet, Joseph, Lockport.
ELLWANGER & BARRY, Rochester.*
Farnam, Newill, Lockport.
Fellows, Henry, Penfield.
Ferris, L. M., Newburgh.
FREEMAN & KENDALL, Ravenswood, L. I.*
Freeoff, P. R., Auburn.
Frost, E. C., Catherine.
Frost, A., & Co., Rochester.
Graves, S. S., Auburn.
Graeff, H. A., & Son, Brooklyn.
Haggerty, James, Poughkeepsie.
Hayward, T. E. P., Pittsford.
Hastings, J. C., Clinton.
Henner & Parker, Mount Morris.
Higgins, D., Flushing.
Hildreth, I., & Co., Watkins.
Hogg, T., Jr., Bloomingdale.
HOOKER, H. E. & CO., Rochester.*
Hooker, Farley & Co., Rochester.
Jacobs, Isaac, King's Ferry.
Jarvis & Wright, Brighton.
King, William, Rochester.
Kelly, S. B., Brighton.
Kelsey, S. T., & Co., Great Valley.
King & Ripley, Flushing.
Lennon, James, Rochester.
Loomis, A., Batavia.
McCarthy, Dennis, Penfield.
McKinster & Cummings, Rochester.
Manley & Mason, Buffalo.
Mattison, R., & Co., Rochester.
MAXWELL, T. C., & BROTHERS, Geneva.*
Maxwells, Ramsden, & Co., Dansville.
Menand, L., Albany.
Moody & Son, Wright's Corners.
Morse, John, Cayuga Bridge.
Moulson, C., Rochester.
MOULSON, SAMUEL, Rochester.*
Murphy, John, Dansville.
Nelson & Barker, Brighton.
Outwater & Cuddeback, Wilson.
Parsons & Co., Flushing, (near New York).
Penfield & Burrell, Lockport.
Powis, C., Greece.
Pratt, Bronson & Merrill, Geneva.
PRINCE, W. R., & CO., Flushing.*
Ranch, J. E., Brooklyn.
Reagles, C., Schnectady.
Reid, A., Florist, New York.
Reid, Robert, Florist, New York.
Ryan, C. J., & Co., Rochester.

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Saul, A. & Co., Newburgh.
Seelye, C. W., Rochester.
Smith, H. C., Fairport.
Smith, W. T. & E., Geneva.
Snyder, H., Kinderhook.
Stone & Cook, Hinmanville.
Stillwell, M., East Hamburgh.
Studley, E. G., Claverack.
Stronger, William D., Penfield.
Thomas & Herendeen, Macedon.
TOWNSEND, W. P., Lockport.*
Thorpe, Smith, Hanchett, & Co., Syracuse.
Thorburn, J. M. & Co., New York.
Tush, B., & Son, Rochester.
UNDERHILL, R. T., Croton Point, Westchester Co.*
Webb, W., Buffalo.
Welch, William, Buffalo,
Weller, A. C., Pittsford.
Williams & Chapman, Manlius.
Wilson, John, Albany.
Wright & Co., Newark.
Yale, T. B., & Co., Brighton.
YEOMANS, T. G., Walworth.*

PENNSYLVANIA

Algier, Frederick, Philadelphia.
Black & Dewey, Williamsport.
Breckbill, Christian, Mt. Pleasant.
Bright, J. W., Rising Sun.
Buist, Robert, Philadelphia.
Clark, John, Connersville.
Cook, Joseph, Philadelphia.
Corson, S. W., Plymouth Meeting.
Croft, Thomas M., Philadelphia.
Darlington, J. L., & Co., West Chester.
Dick, J., Helendale, Kingsessing, Philadelphia.
Dillon, T. & J., Kingston.
Drea, H. A., Martanville, Philadel'a.
Dryburgh, Andrew, Philadelphia.
Fulton, Jas. D., Marcus Hook, Delaware Co.
Hall, William, Philadelphia.
Harvey, Thomas M., Jennersville.
Hillar, Casper, Canestoga Centre.
Hoopes, Isaiah, West Chester.
Kilvington, R., West Philadelphia.
Lowen, John, Pittsburgh.
Lyte & Hough, Enterprise.
Mackenzie, Peter, Philadelphia.
Marshall, A., West Chester.
Maupay, S., Rising Sun Village (near Philadelphia).
Meehan, Thos., Germantown, Philadelphia.
Miller, David, Jr., Carlisle.
Miller, Samuel, Lebanon.
Morris, P., & Co., West Chester.
Powell, James, Holmesburgh.
Price, James M., Oakdale.
Ritchie, W., Kensington, Philadelphia.
SAUNDERS, WM. (Landscape Gardener), Germantown, Phil'a.*
Scott, R., Philadelphia.
Shepler, Joseph, Rostraver.
Shepler, Lewis, Rostraver.
Sherwood, J., Andalusia.
Stewart, M., Philadelphia.
Wakefield, David, Cookstown.
Wardrop, J., Pittsburgh.
Waring, W. G., Boalsburg.
Zimmerman, J., Lancaster

NEW JERSEY.

Allen, Edwin, New Brunswick.
Day, William, Morristown.
Griscom, D. J., Woodbury.
Gustin, J., Newark.
Hance, A., & Son, Red Bank.
Harvey, I., Newark.
Henderson, Peter, Jersey City.
PARRY, WM., Cinnaminson.*
Pullen, Isaac, Hightstown.
Reeve, J., Salem.
Reid, W., Elizabethtown.
Thorburn, George C., Newark.

MARYLAND.

Feast, John, Baltimore.
Feast, W., Baltimore.

Reichard, John, Arch Springs Nursery, Washington Co.
Wilkins, Edward, Chestertown.

VIRGINIA.

Curtis, George D., Moundsville.
Eggeling, E. G., Richmond.
McAnally, Henry, Portsmouth.
Senger, Felix, Lacey Springs.
Taylor, Yardley, Loudon.

NORTH CAROLINA.

Fenties, Greensborough.
Lindley, J., New Garden.
Lindley, T., Cane Creek.
Lutterloh, C., Fayetteville.
Weller & Sydney, Brinkleyville.

GEORGIA.

Camp, Henry, Covington.
Deane, Rev. H. L., Griffin.
Gain, William, Savannah.
Lee, Kidd & Duncan, Columbus.
Mauge, F. A., Augusta.
Moses ——, Columbus.
Nelson, Robert M., Macon.
Peters, Harden & Co., Atlanta.
Thurmond & McPherson, Atlanta.
Redmond, D., Augusta.
Van Buren, J., Clarksville.

ALABAMA.

Baldwin, Dr. W. O., Montgomery.
Harwell, Robert, Mobile.
Moultrie, J. L., Union Springs.
Taunton, Newsom, Opelika.
Weissinger, J. M., Montgomery.

KENTUCKY.

Bell, Charles S., Lexington.
Bryant, H. P., Louisville.
Curtis, G. G., & Co., Maysville.
Gladis, John C., Newport.
Hills, Franklin, Newport.
Hite, O., Louisville.
Hobbs & Walker, Williamson.
Jones, F., Jones' Nursery, Clarke Co.
Kalfus, J. L., Big Springs, Jefferson Co.
Ross, David & Robert, Louisville.

TENNESSEE.

Lishy, L. C., Nashville.
McGrady & Carmichael, Nashville.

MISSOURI.

Hobbs & Williams, Parkeville.
Husmann, George, Hermann.
Siegerson & Brother, St. Louis.

MISSISSIPPI.

Affleck, T., Washington.
Allen, Charles, Vicksburgh.
Hatch & Co., Jackson.
Jones, James, Jr., Columbus.
Swasey, G. B., & Co., Yazoo City.
Whitfield, W. A., Bay St. Louis.

OHIO.

BATEHAM, M. B., & CO., Columbus.*
Beck & Toepfer, Cincinnati.
Bonesall, E., Salem.
Bowen, W. F., Montgomery
Capps, Jabez & Son, Mt. Pulaski
Clarke, D. D., Somerset.
Cook, J. S., Walnut Hills.
Craig, E., Cheviot.
Custead, W. W., Cleveland.
Dana, G., & Son, Belpre.
Davis & Smith, Mechanicsburg.
Edgerton, Jas., Barnesville.
Elliot, F. R., Cleveland.
Elliott, C., Bucyrus.
Ernst, A. H., Cincinnati.
Fair, Joshua, Tippecanoe.
Fay & Dean, Yellow Springs.
Ferris, J. C., & Clark, Pleasant Ridge.
Fulkerson, A., Ashland.
Galloway, J. L., Milford.
Gallup, Jabez, Cleveland.
Gamble, J. W., Hillsborough.
Gillett, H. N., Quaker Bottom.

* See Advertisements.

Harris, Joseph, St. Clairsville.
Heaver, W., Cincinnati.
Hicks, George, Dayton.
Hicks, Isaac & Wm., Tippecanoe.
Hicks, Jacob, Dayton.
Hills, F. G., Loveland.
Jackson, S. S., Cincinnati.
Kelly, M, & Co., Cincinnati.
Kinney, James, Mount Pleasant.
McCullough, J., Cincinnati.
McIntosh, A., Cleveland.
Marshall, S. B., Massillon.
Marshall & Toher, Springfield.
Martinedale & Co., Dayton.
Miller, N., Belfountaine.
Miller & Swan, Enon.
Middleswart, J., South Newcastle.
Mumna, George R., Dayton.
Nicholson, L., & Co., East Rockport.
Orbison & Davis, Troy.
Pfeifer, A., Cincinnati.
Plumley, J. W., Marietta.
Pullen, J. B., Lebanon.
Robinet, A., Bedford.
Sayers, J., Cincinnati.
Schauer, S., & Son, Byron.
Simpson, B., Troy.
Smith, W. A., Springfield.
Stowe & Co., Milan.
Taylor, Edward, Cleveland.
Toledo Nursery Association, Toledo.
Van Cleve, John W., Dayton.
Warder & Gilmour, Springfield.
Wood, Samuel, Smithfield.
Wood, Joel, Mortin's Ferry.
Williams & Lewis, Dayton.
Wise & Son, Dayton.

INDIANA.

Burnett, S., Vincennes.
Fulhart, Peter, Muncie.
Loyd & Son, Lafayette.
Mendenhall, G., Richmond.
Penfield, Burrell, & Co., South Bend.
Railsback & Hutton, Richmond.
Simpson, Tenbrook & Co., Vincennes.
Teas, John C., Rayesville.
Tyler, F. H., Fort Wayne.

ILLINOIS.

Aldrich, Verry, Arispe.
Allen, Isaac C., Lena.
Bacon, E. E. & J. H., Willow Creek.
Bellargee, John, Dover.
Bliss, H. N., Buda.
Bryant, Arthur, Princeton.
Bubach, O. G., Princeton.
Coleman, E. B., Peoria.
Coleman, O. M., Bloomington.
Cook, J. S., Cincinnati.
Curtiss, ——, Paris.
Douglass, Robert, Waukegan.
Doyle, M. & Co., Springfield.
Drake & Coleman, Bloomington.
Dunlap, M. L., Urbana.
Edwards, Samuel, La Moille.
Ellsworth, L., & Co., Napierville.
Ellwood, John, Oneco.
Essex, J. B., Dury's Landing.
Galusha, O. B., Elizabeth.
Harkness, E., California.
Holmberg, A. S., Galesburg.
Holmes, H. H., Rockford.
Holmes & Foster, Waverly.
Hotchkiss, N., Belvidere.
Hull, E. S., Godfrey.
Huntington & Partridge, Rockford.
Kennicott, John A. & Chas., West Northfield.
Kinney, D. F., Rock Island.
Little, J. T., Natchusa Nursery, Dixon.
McWhorter, Tyler, Millersburgh.
Mann, William, Henry.
Myers, David, Magnolia.
Overman, N., & C. R., Canton.
Overman & Mann, Bloomington.
Pennington, L. S., Sterling.
PHŒNIX, F. K., Bloomington.*

*See Advertisements.

Robinson, ——, Granville.
Rodgers, Woodard & Glass, Marengo.
Shaw, Henry, Tremont.
Sherman, J. S., Rockford.
Skinner, E. H., Marengo.
Turner, J. B., Jacksonville.
Wamsley, C. C., Polo.
Whitney, A. R., Franklin Grove.
Willard, J. T., Wethersfield.
Williams, Adnah, Galesburg.
Williams & Head, Carthage.

MICHIGAN.

Adair, William, Detroit.
Hall & Co., Kalamazoo.
Harwood & Dunning, Jackson.
Hubbard & Davis, Detroit.
Nelson, G. C., Grand Rapids.
Page, A. B., Grand Rapids.
Randall, William L., Adrian.
Steerne, B. W., Adrian.
Tomlinson, Dr., Battle Creek.

WISCONSIN.

Baumbanch, William, Milwaukie.
Bell, John, Burlington.
Bell & Dunlap, Milwaukie.
Brayton, J. C., Aztalan.
Cahoon, B. P., Kenosha.
Colby & Willey, Janesville.
Comstock, C., Milwaukie.
Drake, E. B. & J. F., Janesville.
Drake, F., & Co., Racine.
Gaston, N. L., Delevan.
Gifford, Charles, Milwaukie.
Hanford, A. G., Waukesha.
Kellogg, G. G. & S. H., Janesville.
Loudon & Robinson, Janesville.
Parker, R. W., Milwaukie.
Plumb, J. C., & Co., Lake Mills.
Stickney & Loveland, Nauwatosa.

IOWA.

Boardman, S., K., Lyons.
Fahnestock & Horr, Dubuque.
Finley & Dwire, Davenport.
Foster & Negus, Muscatine.
Leonard, David, Burlington.
Longworth, William, Dubuque.
Matthews & Gamble, Knoxville.
Nealley & Bros., Burlington.
Plumb, W. H., Fort Dodge.
Smith, James, Fort Des Moines.
Tenbrook, J. W., & Co., Rockville.
Williams, George B., Keokuk.

CALIFORNIA.

Briggs, Go. G., Briggs' Ranche.
Fox, B, S. & Co., San Jose.
Thompson, Wm. N., San Francisco.

DISTRICT OF COLUMBIA.

Douglass, J., Washington.
Saul, John, Washington.

MINNESOTA.

Ford, L. M., & Co., St. Paul.
Stewart, Amasa, Le Leur.

OREGON.

Geer, Ralph, Fruit Farm, Marion Co.
Ladd, J. W., Buteville.
Meek & Luelling, Milwaukie.
Stanton, A., Salem.
Walling & Angel, Spring Valley.

NEBRASKA.

Masters, J. H., Nebraska City.

CANADA WEST.

Arnold, Charles, Paris.
Binkley, Jacob, Hamilton.
Carnes & Warrin, Galt.
Dougall, J, Windsor.
Dunning, Campbell & Co., Wellington Square.
Fairchild, T., & Co., Mohawk.
Falconer, Duncan, near Mitchell.
Fisher, David, Bowmanville.
Fleming, J., Toronto.
Freed, John, Hamilton.
Greig, J., Pickering.
Gilmour, J. W., Peterborough.
Gray, J., Toronto.
Kelly, E., & Co., Hamilton.
Lee, Daniel, Normandale.

Lee, David M., Ancaster.
Leslie, G., Toronto.
Lovekin, James, Clark.
Moore, E. & J., Hamilton.
Murray & Thompson, Ancaster.
Planin, J., Toronto.
Racey & Murray, Mount Pleasant.

Thomas, J. P., Belleville.

CANADA EAST.

Cockburn & Brown, Montreal.

NOVA SCOTIA.

Harris, John, Halifax.

THE

NEW ROCHELLE BLACKBERRY

AT $15 PER HUNDRED, $125 PER THOUSAND.

ALSO, THE

ORANGE, FASTOLF, FRANCONIA & ANTWERP RASPBERRIES,

AT VERY LOW RATES, BY THE HUNDRED OR THOUSAND.

THE

HOVEY, WALKER, JENNY'S SEEDLING, LONGWORTH'S PROLIFIC, McAVOY'S SUPERIOR, & BURR'S NEW PINE STRAWBERRIES,

AT $1 PER HUNDRED, $7 PER THOUSAND.

THE ALBANY, HOOKER, AND PEABODY'S SEEDLING,

AT $6 PER HUNDRED.

☞ These Plants are cultivated here for the fruit, and are warranted true to name.

ALSO,

FRUIT AND ORNAMENTAL TREES AND SHRUBS,

ROSES, VINES AND BEDDING PLANTS.

S. P. CARPENTER, New Rochelle, N. Y.

GRAIN DRILLS.

Seymour's Grain Drill,

Capable of sowing all kinds of Grain, from Peas to Grass Seed, and also fine Fertilizers, either broadcast or in drills; and

Seymour's Grain Drill for One Horse,

Arranged and completely adapted to drilling among Corn while it stands on the ground as it grew; also

Seymour's Broadcast Sowing Machine,

Capable of sowing all kinds of Grain and Seed, and all fine Fertilizers, broadcast; are all supplied to order, by C. H. SEYMOUR. Those wishing further information will receive our Circular, and a prompt reply to all inquiries, by addressing

C. H. SEYMOUR, Manufacturer, or
P. SEYMOUR, Inventor,
East Bloomfield, Ontario County, N. Y.

MOUNT HOPE NURSERIES.

ROCHESTER, N. Y.

(ESTABLISHED IN 1839.)

These Nurseries occupy Four Hundred Acres of Land, and contain, at the present time, an immense stock of

TREES, SHRUBS AND PLANTS.
STANDARD FRUIT TREES, for Orchards.
DWARF FRUIT TREES, for Gardens.
HARDY GRAPE VINES, for Vineyards.
FOREIGN GRAPES, for Vineries.
SMALL FRUITS, CURRANTS, GOOSEBERRIES, &c.
RHUBARB, ASPARAGUS, &c.
WALNUTS, CHESTNUTS, FILBERTS, and all other Fruits grown in the Northern States. All are of the most healthy and vigorous growth, and Guaranteed as to accuracy.

The Ornamental Department

Is proportionately extensive, and embraces, of new and old, whatever has been found worthy of cultivation.

RAPID GROWING TREES, for Avenues.
BEAUTIFUL LAWN TREES.
EVERGREENS, all that are worthy of cultivation, in large quantities.
FLOWERING SHRUBS.
ROSES, of all classes, in several hundred varieties.
PÆONIES, Shrubby and Herbaceous.
BULBOUS ROOTS, including the finest Hyacinths, Tulips, &c.
DAHLIAS, one hundred superb New Varieties, of proved excellence.
GREEN AND HOT HOUSE PLANTS, the most popular and beautiful species and varieties.
HEDGE PLANTS, consisting of Osage Orange, Privet, American Arbor Vitæ, &c
STOCKS, for Nurserymen.

All these articles are offered at low prices, and on the most accommodating terms.

Packing for any part of the United States, Canadas, or Europe, done in the most perfect manner.

The following priced Catalogues, furnishing full information, will be sent gratis and pre-paid, to all who apply and inclose one stamp for each.

No. 1. A Descriptive Catalogue of Fruits.
No. 2. A Descriptive Catalogue of Ornamental Trees, Shrubs, Roses, &c.
No. 3. A Catalogue of Dahlias, Verbenas, Petunias, and Select Green House and Bedding Plants.
No. 4. A Wholesale Catalogue, or Trade List.

We have no traveling or local Agents, except those who are furnished with proper certificates, signed by us. Address,

ELLWANGER & BARRY, ROCHESTER, N. Y.

Bloomington Nursery and Garden.

At this establishment may be found a large and reliable assortment of FRUIT and ORNAMENTAL TREES, SHRUBS and PLANTS, at wholesale and retail. Standard and Dwarf Apples, Pears and Cherries, Plums and Peaches, Grapes, Quinces, Currants, Gooseberries, Raspberries, Strawberries, Asparagus, Rhubarb, Hedge Plants—of the varieties most approved at the West.

GARDEN PLANTS.

Cabbage, Tomato, Sweet Potato, Celery, Cauliflower, Egg Plants, &c., &c.

EVERGREENS.

A fine variety, and many of large size, now growing here on Prairie soil, and therefore thoroughly acclimated. The Proprietor is prepared to contract for planting Evergreens (in suitable enclosures) in Towns accessible by Railroad, and not too remote, and guaranty them to live through the first summer.

Having in process of erection a commodious Green House, he expects to be prepared in the spring (of '58) to execute orders for a good assortment of Green House and Bedding Plants. The collection of Hardy and Tender Bulbs, and Flower Roots, as Tulips, Hyacinths, Crown Imperials, Dahlias, Tuberose, Tiger Flowers, Amaryllis, &c, &c., is very large, and especial attention invited to them. ☞Boquets furnished. Also a very large assortment of

YOUNG NURSERY STOCK,

consisting in part, of 2 year Apple Seedlings, Apple, Pear and Plum Root Grafts, put up ready for transportation in the Spring. One year root—

GRAFTED APPLE TREES,

Also, Grapes, Currants, Gooseberries, Raspberries, Rhubarb, with young Stocks of many sorts; Dwarf Apple, Quinces, Pear, Cherry, and

MANY SORTS OF

YOUNG ORNAMENTAL PLANTS,

Including a fine stock of small Evergreens, comprising

NORWAY SPRUCE,

BALSAM FIR, WHITE PINE, SCOTCH PINE, ARBOR VITÆ,

HEMLOCK SPRUCE,

All cheap for CASH; or a part of the young Nursery stock the Proprietor would furnish on contract, in exchange for good unimproved lands at reasonable rates, or time given for payment.

☞For particulars, see Catalogues, or address the subscriber. Inquiries promptly answered.

F. K. PHOENIX,
Bloomington, Ill.

SPLENDID VERBENAS
FOR 1858.

DEXTER SNOW,
VERBENA FLORIST,
CHICOPEE, MASSACHUSETTS,

Respectfully solicits the attention of all admirers of this indispensable bedding Plant, to his unrivalled collection, numering near 350 famed varieties, including everything worthy of cultivation that has been sent out up to the present time.

For the convenience of those not acquainted with the different varieties, he has selected a number of the very choicest, and arranged them in packages, which he believes will be found both very convenient and quite satisfactory, as they are selected with strict regard to as much variety of color as possible, including only such as are strong growers, good bloomers, and bearing large trusses of flowers. And a person in making out an order, has only to enclose the money, and number of package desired, without being obliged to write off a list of names.

Package No. 1 will embrace thirteen distinct first class varieties, including two novelties and two fragrant varieties, for $1,75.

Package No. 2 will embrace twenty-five distinct first class varieties, including four novelties and the fragrant ones for $3.

Package No. 3, fifty first class varieties, including six novelties and the fragrant varieties, for $5.

TO SAVE EXPENSE IN EXPRESS CHARGES,

Four or more persons may club together and have their packages forwarded in the same box, yet each kept separate from the other, so that they may be distributed without difficulty.

If ordered early in the season, plants may be forwarded perfectly safe by mail any distance within three days of Chicopee. Plants were forwarded in this way the last season to Alton and Chicago, Ill., Hagerstown, Md. (This last package was five days in the mail bags, and yet every plant was alive and strong,) and many packages to various parts of Ohio with admirable success.

For $2 enclosed, package No. 1 will be forwarded, post paid.

For $3,50, package No. 2, post paid, and for $6, package No. 3, post paid.

If ordered previous to May 10th, THE PLANTS WILL BE WARRANTED DELIVERED IN HEALTHY CONDITION any distance within three days' travel of Chicopee, so that there shall be no risk on the part of the purchaser.

Purchasers will please bear in mind, that the subscriber devotes

HIS ENTIRE TIME AND ATTENTION TO THE CULTURE OF THE VERBENA.

No other plant whatever is sold from his establishment, and all customers may rely upon getting their plants properly labelled, and true to name and description, as found in his ANNUAL CATALOGUE, an edition of which for 1858 will be ready in January, and copies will be forwarded free to all enclosing their names.

Address, DEXTER SNOW,
Chicopee, Hampden Co., Mass.

SEEDS, TREES, PLANTS, &c.

The subscribers offer for sale, at their Horticultural Establishment, No. 7 Merchant's Row, Boston, a large and very select assortment of

AGRICULTURAL, GARDEN, AND FLOWER SEEDS,

of the most reliable quality; embracing all the newest and most esteemed sorts of Peas, Beans, Cauliflowers, Cabbages, Lettuces, Radishes, Beets, Carrots, Onions, Turnips, Melons, Cucumbers, Squashes, Corn, &c., &c.

Their assortment of

FLOWER SEEDS

is very extensive and complete, and contains a large number of the most choice and select kinds, which have been grown in their own grounds, such as splendid Double Asters, Double Camellia Balsams, Double Stocks, and Larkspurs, large Pansies, Carnations, Picotees, Petunias, extra fine Verbenas, and other established favorites, which are indispensable in a good flower garden, and are recommended as very superior to those which are usually imported.

ALSO,

A large collection of the most beautiful and choice varieties, received direct from the best growers of Flower Seeds in England, France and Germany, including the finest Calceolarias, Cinerarias, Chinese Primrose, German Stocks, French and German Asters, Double Hollyhocks, Marigolds, Ipoameas, Lobelias, Dianthus, Delphiniums, and many new sorts of very recent introduction.

COLLECTIONS OF FLOWER SEEDS.

BY MAIL, FREE OF POSTAGE.

The following collections of flower seeds, (selected by Hovey & Co.,) comprising the most beautiful and showy Annuals, Biennials, and Perennials, embracing the finest

DOUBLE GERMAN ASTERS, DOUBLE BALSAMS, GERMAN STOCKS, LARGE PANSIES, CARNATIONS, PICOTEES, DOUBLE HOLLYHOCKS, CALCEOLARIAS, CINERARIAS, PETUNIAS, &c.,

will be sent by MAIL, FREE OF POSTAGE, to any part of the United States, at the following prices, viz:—

No. 1.—Consisting of ONE HUNDRED VARIETIES of Annuals, Biennials, and Perennials, embracing many of the newest and choicest flowers, $7.00. No. 2.—Consisting of FIFTY VARIETIES of choice and beautiful Annuals, Biennials, and Perennials, $4.00. No. 3.—Consisting of FIFTY VARIETIES showy Annuals, $2.00. No. 4.—Consisting of TWENTY CHOICE VARIETIES of Annuals, $1.00. No. 5.—Consisting of TEN EXTRA FINE NEW VARIETIES of Annuals and Perennials, $1.

ALSO,

from their Nurseries, at Cambridge, a large stock of Fruit Trees, embracing all the best sorts of Pears, Apples, Plums, Peaches, Cherries, and other Fruits, Grape Vines, Strawberries, Currants, Raspberries, Gooseberries, &c. The finest Ornamental and Shade Trees, Evergreen Trees; Hedge Plants; Flowering Shrubs; Roses; and Climbing Plants,—also a very large collection of Green-House Plants, of Every description.

Purchasers will find at this Establishment every desirable variety of Seeds, Trees and Plants, necessary for the Farm or Garden; Catalogues of which will be furnished gratis, on application, post paid.

The best Peruvian Guano, Super-Phosphate of Lime, Bone Dust and other fertilizers, constantly for sale, at low prices. Terms Cash, or a satisfactory reference.

HOVEY & CO.,
No. 7 Merchant's Row, Boston.

ROCHESTER COMMERCIAL NURSERIES.

These long established and very extensive Nurseries are now, as heretofore, conducted under the most thorough and rigid personal supervision of the proprietors, who devote their entire time to the propagation, cultivation and dissemination of such Fruit and Ornamental Trees, &c., as are found worthy of general cultivation.

We spare no pains to add from time to time such *new* Fruits and Trees as are proved to be valuable.

Among the items always to be found in our grounds, and cultivated in large quantities, are the following:

STANDARD FRUIT TREES, FOR ORCHARDS.

APPLES, PEARS, CHERRIES,
PEACHES, PLUMS, APRICOTS,
NECTARINES, QUINCES, &c. &c. &c.

DWARF FRUIT TREES, FOR GARDENS.

APPLES, PEARS, CHERRIES.

GRAPE VINES—ALL THE BEST NATIVE VARIETIES.

SMALL FRUITS, consisting in part of CURRANTS, GOOSEBERRIES, STRAWBERRIES, RASPBERRIES, BLACKBERRIES, &c.
RHUBARB, ASPARAGUS, &c.
OSAGE ORANGE Hedge Plants.
ARBOR VITÆ, for Hedges and Screens—fine plants, low.
WILLOWS, of all the best sorts, for basket work.
SCIONS—all the popular varieties, supplied low.

Stocks for Nurserymen.

We take especial care to have a full supply of the best quality of Seedling and other Stocks, among which may be found the following, fine and cheap:

SEEDLING APPLE STOCKS, MAZZARD CHERRY STOCKS,
SEEDLING PEAR STOCKS,
Seedling Plum Stocks, Angers Quince Stocks,
Cheaper than they are imported.

And in short a full supply of such HARDY and useful articles in our line as are adapted to the wants and tastes of "the million"

THE HOOKER STRAWBERRY.

This invaluable variety originated on our grounds, and may always be had of us, pure and strong.

"Descriptive" and "Wholesale" Catalogues published annually.

H. E. HOOKER, }
F. W. GLEN. }

R. E. HOOKER & CO.,
Rochester, N. Y.

OLD ROCHESTER NURSERIES, ROCHESTER, N. Y.

S. MOULSON

OFFERS FOR SALE

An Extensive Collection of Fruit and Ornamental Trees,

EMBRACING

APPLES, Standard and Dwarf;
PEARS, do. do.
CHERRIES, do. do.
PEACHES;
PLUMS;
GRAPES, Native and Foreign;

Currants, Gooseberries, Strawberries, Raspberries, Chestnuts, Walnuts and Filberts; and in

THE ORNAMENTAL DEPARTMENT

WILL BE FOUND

EVERGREEN TREES, of American growth, from the seed;
ROSES, in many varieties, of the hardy classes;
FLOWERING SHRUBS AND BULBS;
HEDGE PLANTS. Also,

STOCKS FOR NURSERYMEN.

Catalogues of varieties, with prices affixed, can be obtained by all applicants who forward a stamp for prepayment.

LINNÆAN GARDENS & NURSERIES, FLUSHING, N. Y.

WILLIAM R. PRINCE & CO.

Refer to their Special Catalogues of each Department, with prices, by which purchasers will be able fully to realize the great extent of their Collections, and the moderate prices charged for the articles. These Catalogues will be sent to all applicants who enclose stamps.

Blackberries, Raspberries, Currants, Gooseberries, Strawberries, and other small fruits, will be sold very low by the quantity.

No. 1.—Descriptive Catalogue of Fruit and Ornamental Trees, Shrubs and Plants. No. 2.—Roses, Carnations, Chryrsanthemums, Phlox, and all other Herbaceous Flowering Plants.

No. 3.—Extra large Fruit Trees, Evergreens, and other Ornamental Trees and Shrubs, suitable for immediate fruit-bearing and embellishment.

No. 4.—Wholesale Catalogue for Nurseries and Dealers, comprising Trees, Shrubs, Plants, Bulbous Flower Roots, Stocks for Engrafting, and Tree and Shrub Seeds, &c. No. 5.—Wholesale Catalogue of Vegetable, Agricultural and Flower Seeds. No. 6.—Descriptive Catalogue of our unrivaled collection of 100 Select Varieties of Strawberries, with a rejected list. No. 7.—Rare American Trees, Plants and Seeds, suitable for sending to Europe. No. 9.—Catalogue of Bulbous Flowers of every class, including Tree and Herbaceous Pæonies, Dahlias, and other rare Flowering Plants. No. 11.—Treatise on Culture of the Chinese Potato, or *Dioscorea Batatas;* on Licorice, Tanner's Sumach, Fig, Almond, Olive, Osier, Chinese Sugar Cane, Earth Almond, and Madder.

N. B.—All orders are packed in a superior manner, and forwarded by Express or otherwise, as requested.

W. P. TOWNSEND,

LOCKPORT, N. Y.,

OFFERS FOR SALE

100,000 Angers Quince Stocks;
10,000 Standard Apple Trees;
15,000 Evergreens, such as Norway Spruce, Scotch Pine, Austrian Pine, Chinese, Siberian and American Arbor Vitæs, English Yew, &c.

Also, a large stock of DWARF PEARS, two years from the bud, and a fine lot of large, bearing trees.

Also, a good stock of STANDARD PEARS, and STANDARD AND DWARF CHERRIES, with a fine assortment of Hybrid Perpetual Roses and Ornamental Trees, &c.

I shall also have a large quantity of MAHALEB CHERRY STOCKS, and as I intend giving increased attention to the propagation of Nursery Stock, I shall make my collection one in every way desirable.

RAVENSWOOD FRUIT GARDEN.

SMALL FRUITS—WHOLESALE AND RETAIL.

We cultivate the choicest Small Fruits for New York Market, and now offer for sale well rooted, good sized plants, including BRINCKLES ORANGE RASPBERRY, which we grow extensively, and consider the highest flavored, most beautiful and productive of all. Also, the Col. Wilder, Thunderer, and Cushing Raspberries, and MYATT'S LINNÆUS RHUBARB, a new English variety—very superior, particularly tender, fine flavored, and productive. Chas. Downing states it the best variety for both market and garden culture. See his article in Horticulturist, August, 1857.

We have also Hovey's Seedling, Boston Pine, and large Early Scarlet Strawberries; New Rochelle Blackberries; Black Naples Currants, &c., &c. We offer the Plants at low rates for cash, and on large orders for market gardening, &c., make liberal discount.

FREEMAN & KENDALL,
Ravenswood, L. I., near New York.

We have visited Messrs. Freeman & Kendall's Fruit Garden, from which they are now offering to sell Plants, and we can say their Plants are well grown, and very superior varieties—the Orange Raspberry and Linnæus Rhubarb particularly.

CHARLES DOWNING, Newburgh.
C. W. GRANT, Iona, near Peekskill.

FRUIT TREES AND FRUIT.

The subscriber being extensively engaged in the Nursery business, and having planted over one hundred acres of Orchard, embracing more than 10,000 Trees, enabling him to test and compare varieties and propagate only those of real value, is prepared to furnish Trees in large quantity, at prices heretofore unknown to the Tree trade.

The present stock embraces about 300,000 Apple Trees, of various sizes, among which is an abundant supply of Baldwins and Greenings.

15,000 Cherry Trees, one and two years old, 4 to 12 feet.

20,000 Peach Trees, of best market sorts.

45,000 two years old, and 100,000 one year old, Dwarf Pear Trees of very superior quality; the former are believed to be *the best* lot in the United States, and warranted *equal* to the best.

Also, a general assortment of other Fruit and Ornamental Trees and Plants, at low prices.

Persons visiting the grounds before October, can see several hundred Dwarf Pear Trees in full bearing; and any who doubt their success for orchard culture, are especially invited to examine them.

T. G. YEOMANS,
Walworth, Wayne Co., N. Y.

ISABELLA AND CATAWBA GRAPE VINES,

OF PROPER AGE FOR FORMING VINEYARDS.

Cultivated from, and containing all the good qualities which the most improved cultivation for over sixteen years has conferred on the Croton Point Vineyards, are offered to the Public. Those who may purchase will receive such instructions for four years, as will enable them to cultivate the Grape with entire success, provided their locality is not too far north.

All communications addressed to R. T. UNDERHILL, M. D., New York; or Croton Point, Westchester County, N. Y., will receive prompt attention.

The additional experience of the four past seasons gives him full assurance that, by improved cultivation, pruning, &c., a crop of good fruit can be obtained every year, in most of the Northern, and all of the Middle, Western and Southern States.

N. B. To those who take sufficient to plant six acres, as he directs, he will, when they commence bearing, furnish the owner with one of his Vine-dressers, whom he has instructed in his mode of cultivation, and he will do all the labor of the Vineyard, and insure the most perfect success. The only charge, a reasonable compensation for the labor.

Also, APPLE-QUINCE TREES, (which are sometimes called the Orange Quince,) for sale as above. R. T. UNDERHILL, M. D.

J. DONNELAN & CO.,

OF THE

Rochester and Lake Avenue Commercial Nurseries,

ROCHESTER, N. Y.,

Wish to inform their friends and customers that they have on hand for Fall Sales the following select assortment of Standard and Dwarf Fruit Trees, Evergreen and Weeping Trees, Ornamental Deciduous and Climbing Shrubs,

A numerous variety of select French and Domestic Roses, Pæonies, Phloxes, &c., &c.,

Hardy Herbaceous and Hedge Plants, Bulbous Roots, Double Dahlias, &c., &c., which they will sell in quantities to suit purchasers, and on moderate terms.

100,000	3 and 4	year old	Apple Trees,	choicest	kinds,	
140,000	2	"	"	"	"	"
130,000	1	"	"	"	"	"
10,000	2	"	Peach	"	"	"
10,000	1	"	"	"	"	"

with an equal quantity of Pears, Plums, Cherries, &c.

We have also 100,000 Manetta Stocks for Roses, first quality.
50,000 extra 2 year old Apple Stocks.
40,000 " Mazzard Cherry "
5,000 1 and 2 year old Horse Chestnut Seedlings.

☞ Descriptive and Price Catalogues furnished gratis.

THE MASSACHUSETTS WHITE.

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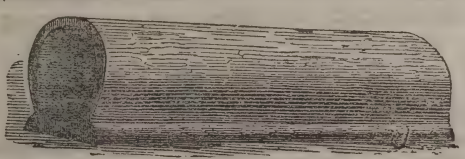

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THE

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HORTICULTURAL DIRECTORY,

FOR THE YEAR 1859;

CONTAINING TREATISES ON

UNDERDRAINING ORCHARDS AND GARDENS, BRITISH BREEDS OF CATTLE, CULTIVATION OF RUTA BAGAS, DUCKS, GEESE, AND SWANS, CULTURE OF FRUIT TREES IN POTS UNDER GLASS, FRUIT CULTURE AT THE WEST, ETC., ETC.

TOGETHER WITH A LIST OF

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AT ITS SESSION HELD IN NEW YORK, 1858.

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1859.

PREFACE.

The circulation of the Rural Annual and Horticultural Directory is no longer confined to those interested only in the science and practice of Horticulture. Thousands of its readers are also interested in Agricultural pursuits. We have therefore introduced articles not strictly Horticultural, and have endeavored to impart a more general character to its contents. We think this will render it more interesting and useful to the majority of its readers.

The articles of Mr. Ernst and Mr. Bateham will be read with much interest by fruit-growers in all sections of the country, and will especially afford much useful information to the Horticulturists of the West.

The article on Aquatic Poultry, by Mr. Bement, contains much valuable information, while its pleasant style will render it interesting to every rural reader.

The article on Underdraining for Orchards and Gardens is perhaps not as practical as is desirable; but if it should have the effect of calling the attention of Horticulturists to this important but too much neglected subject, the object of its publication will be attained.

The List of Fruits recommended for general cultivation and as promising well, by the American Pomological Society, at its last session, will be useful in selecting varieties for planting; though in some sections it will be advisable also to consult local experience.

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THE

RURAL ANNUAL

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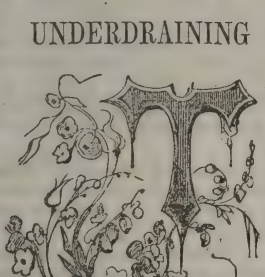
UNDERDRAINING ORCHARDS AND GARDENS.



HE roots of plants absorb from the soil an immense quantity of water. This water holds in solution the organic and inorganic elements of plants. After it has circulated through the plant, and these elements are filtered from it and deposited in their appropriate places in the plant, the water is given off through the leaves into the atmosphere. It has been ascertained by careful experiments, that our common forage plants take up from the soil and give off through their leaves two hundred pounds of water for every pound of organic matter (oxygen, hydrogen, nitrogen and carbon) found in the plants when grown; and that for every pound of mineral matter, (potash, soda, lime, magnesia, phosphorus, sulphur, chlorine, and silica,) organized in the plants, *two thousand* pounds of water has been absorbed and evaporated.

It will be seen that plants take up their food in an exceedingly dilute form. The water they imbibe is, on the whole, freer from impurities than that of most springs and rivers. However beneficial any manure may be, when judiciously applied, a strong solution of it, if absorbed by the plant, will prove injurious, and not unfrequently fatal.

While, therefore, plants require a large supply of water, it is essential to their health and productiveness that it be in a condition suitable for assimilation. Experience proves that stagnant water is injurious. An eminent scientific writer lays it down as an axiom, that "plants should never have more water than they can consume." In soils saturated with water, the air is excluded, and those chemical changes requisite for the proper preparation of the food of plants in the soil are arrested. The roots of plants, too, absorb oxygen and carbonic

acid; but when surrounded by stagnant water this process is arrested, and the proper functions of the plant are deranged. No wonder that under such circumstances the plants present a yellow and sickly appearance.

But the principal reason why an excess of water in the soil is injurious is, that it *keeps the soil cold.* The heat from the sun, instead of warming the soil, is expended in evaporating the surplus water which it contains, — and few persons have any idea of the immense quantity of heat required to *evaporate* water. The experiments of Dr. BLACK show that to evaporate a given quantity of water requires as much heat as would raise the water, if it remained in a liquid state, to 1022° Fahr.! It makes no difference whether the water is evaporated at an ordinary temperature, by what is called *spontaneous evaporation*, or whether it is converted into steam by the application of artificial heat. Vapor or steam is simply water, *combined with* 940° *of heat.* Numerous experiments have since been made on this point, and from them the latent heat of steam is assumed as equal to about 1000°. A writer in the *Quarterly Review* states that one pound of water evaporated from one thousand pounds of soil will reduce the temperature of the whole mass ten degrees.

Gardeners understand and appreciate the beneficial effects of "bottom heat" in starting seeds and growing tender plants; hence the employment of tan, hot-beds, &c. But how few seem to consider the importance of a proper temperature of the soil, for growing our common field and garden plants, trees, &c. The temperature of the atmosphere is the subject of constant observation and remark, while that of the soil is almost entirely neglected. It is of more importance, in a practical point of view, than the temperature of the atmosphere, inasmuch as the latter is almost entirely beyond our control, while the temperature of the soil can be increased or diminished, to some extent, by underdraining, mulching, &c. Some soils are naturally warmer than others, and if we knew what temperature of the soil is most favorable to the growth of certain species, we might plant them on cold or warm soil — as in fact experienced gardeners do now to some extent.

From the observations that have been made in various parts of the world, it would appear that the temperature of the part of the soil in which plants grow, is universally something higher than that of the air by which they are surrounded. For horticultural purposes, a far more extensive series of observations are required than have as yet been made, but we have enough to show the great importance of a warm soil. Dr. LINDLEY, in the last edition of his "*Theory and Practice of Horticulture*," well observes:—"How the warmth of the soil may act as a protection to plants will be easily understood. A plant is penetrated in all directions by innumerable air passages and chambers, so that there is a free communication between its extremities, however far they may be apart. It may therefore be conceived that if, as necessarily happens, the air inside the plant is in motion, the effect of warming the air in the roots will be to raise the internal temperature of the

whole individual; and the same is true of its fluids. Now, when the temperature of the *soil* is raised to 150° at noonday by the force of the solar rays, it will retain a considerable part of that warmth during the night: but the temperature of the *air* may fall to such a degree that the excitability of a plant would be too much and suddenly impaired, if it acquired the coldness of the medium surrounding it; this is prevented, we may suppose, by the warmth communicated to the general system, from the soil, through the roots; so that the lowering of the temperature of the air, by radiation during the night, is unable to affect plants injuriously, in consequence of the antagonistic force exercised by the heated soil. It is not improbable that this fact may be hereafter applied in gardening to the acclimating of half-hardy plants. Were an open border heated artificially in the winter, it is possible that plants might endure an amount of cold upon their stems and leaves, which in the absence of such heat would be fatal to them. An experiment upon this subject was tried some years ago, and although it was conducted so negligently and unskilfully, as not to justify any inference being drawn from it, yet the result, such as it was, was full of promise."

We have heretofore expressed the opinion that the primary cause of the disease in peaches, known as the *curl of the leaves*, and of the black knot in plums, is the low temperature of the soil in spring, as compared with the temperature of the air. Whether this be so or not, there can be no doubt that a cold soil has a very injurious influence on vegetation, — especially on those trees and plants which were originally brought from warmer climates. "This necessity of warmth at the root," says Dr. LINDLEY, "undoubtedly explains in part why it is that hardy trees, over whose roots earth has been heaped or paving laid, are found to suffer so much, or even to die: in such cases, the earth in which the roots are growing is constantly much colder than the atmosphere, instead of warmer.

"It is to the coldness of the earth that must be ascribed the common circumstance of vines that are forced early not setting their fruit well, when their roots are in the external border and unprotected by artificial means; and to the same cause is often to be ascribed the *shanking* or shrivelling of grapes, which most commonly happens to vines whose roots are in a cold and unsunned border."

"Mr. KNIGHT long since mentioned an important fact connected with this subject: — 'It is well known," he said, "that the bark of oak trees is usually stripped off in the spring, and that in the same season the bark of other trees may be easily detached from their alburnum, or sap-wood, from which it is, at that season, separated, by the intervention of a mixed cellular and mucilaginous substance; this is apparently employed in the organization of a new layer of fibre, or inner bark, the annual formation of which is essential to the growth of the tree. If, at this period, a severe frosty night or very cold winds occur, the bark of the trunk, or main stem, of the oak-tree becomes again firmly attached to its alburnum, from which it cannot be separated till

the return of milder weather. Neither the health of the tree, nor its foliage, nor its blossoms, appear to sustain any material injury by this sudden suspension of its functions; but the crop of acorns invariably fails. The apple and pear trees appear to be affected to the same extent by similar degrees of cold. Their blossoms, like those of the oak, unfold perfectly well, and present the most healthy and vigorous character, and their pollen sheds freely. Their fruit, also, appears to set well; but the whole, or nearly the whole, falls off just at the period when its growth ought to commence. Some varieties of the apple and pear are much more capable of bearing unfavorable weather than others, and even the oak-trees present, in this respect, some dissimilarity of constitution.'

"It is also the coldness of the soil which causes the production of roots upon the stems of the vine in a hot damp vinery; which diminishes or prevents coloring; which renders it impossible to ripen wood; and which deteriorates the quality of the grape. Hence all good vine-growers now look more to the temperature of their borders than to its mechanical condition.

"The Formation of Aerial Roots by vines is an unmistakeable sign of the coldness of the border. Vineries may be seen with these roots hanging down like beards from the branches; and these are always followed by bad grapes, unless means are taken to heat the border. The explanation of the phenomenon seems to be this:—

"The vine possesses a very strong vegetating power, which is manifested whenever sufficient heat and moisture are present. It is also well known that if one portion or shoot of a vine-plant is introduced to an atmosphere congenial to its growth, the buds will push into foliage and shoots; whilst the rest of the plant, exposed to cold, will not be perceptibly affected, and will contribute nothing to the active vegetation of the branch introduced to heat and moisture. According to circumstances, therefore, vegetation may be active in one part, and at the same time comparatively dormant in another part of the same vine-plant. If the natural roots are dormant owing to the low temperature to which they are exposed, then unnatural roots will be formed by branches if in a state of growth. Moisture favors the formation of these roots; they shrivel in hot dry weather, but push again on the return of a dull or moist state of the atmosphere. They arise from the shoots being in a highly favorable situation for growth, and the roots in the reverse. The leaves elaborate a quantity of sap proportionate to their size, and to the share which light has had in perfecting their development. Part of this elaborated sap is appropriated by the above-ground portion of the plant. But in ordinary cases, and more especially where a vigorous growth is promoted, there is always a surplus beyond what the stem and its dependencies above ground require, and the proper destination of this is the roots, in order that their increase may correspond with that of the plant above them. But roots in a border five feet deep, and of a clayey nature, will be in a temperature little above 40° early in the spring. At about 40° water

has its greatest density. Under such circumstances any movement in the fluids of the roots must be extremely sluggish; and were these roots as open to observation as the stem is, there is no doubt they would be found as dormant as a shoot left outside in the cold, compared with another introduced to the heat of a forcing-house. When the roots of vines are healthy, in proper soil sufficiently warm, their growth proceeds in due proportion to that of the top, but if they are badly conditioned, they can neither act their part nor appropriate their share of the returning juices; consequently an accumulation of the latter takes place in the stems, and, favored by the moist warm atmosphere of the vinery, bursts through the bark in the form of fibres, continuing to lengthen till they are checked by drouth."

Is not the black knot in the plum caused in the same way? Is not the sap in the trunk and branches of the tree stimulated into activity by the warmth of the atmosphere, and is not that portion of it which should form new roots checked in its descent and forced out in the form of excrescences on the trunk and branches? Is not the black knot simply an exudation of diseased sap, caused by the coldness of the soil, and would not any method which tends to restore the equilibrium between the temperature of the air and that of the soil tend to mitigate this disease? We should not expect a man to enjoy good health, if, while living in a warm room, his feet were constantly cold and wet. Why, then, should we expect trees to be healthy under similar circumstances?

Soils hold a given quantity of water, by the mere force of attraction, even when the drainage is most perfect. If more than this is present, and it is not carried off by drainage, the heat from the sun, which should warm the soil, is expended in evaporating this water. How great is the loss of heat in this way we have already shown. "There can be no sort of doubt," says Dr. LINDLEY, "that the advantage derived from draining cold countries, is owing greatly, if not exclusively, to the augmented temperature which attends the removal of stagnant water from land." It has been found by repeated trials that a well underdrained soil is usually about 10° warmer than one that is undrained. Prof. SCHUBLER has proved that the loss of heat caused by evaporation, in undrained lands, amounts to 11¼° to 13½°. In draining the Red Moss, near Bolton-le-Moors, Mr. PARKES found the thermometer in the drained land rose in June to 66°, while in that which was not drained it would never rise above 47° — a gain of 19°. SIMPSON says he has "frequently found the soil of a field higher in temperature from 10° to 15° than that of another field which had not been drained, though in every other respect the soils were similar."

Unlike animals, plants do not generate heat; they are dependent on the soil, and it is evident that a tree absorbing sap ten or fifteen degrees warmer than another, would be far less susceptible to sudden depressions of atmospheric temperature. During cold nights, evaporation from the leaves is nearly suspended; there would consequently be little loss of heat, and in a warm soil the temperature of the tree

might be much higher than the surrounding atmosphere. While, therefore, the atmospheric changes are beyond the reach of the cultivator, he may do much to mitigate their injurious effects, by raising the temperature of the soil, — and this he is enabled to do by thorough underdraining.

"But is there no danger of making the land too dry?" Not the least. One hundred grains of pure, dry sand, *placed on a filter*, which affords much more perfect drainage than any method that can be adopted in practice, imbibed and retained 25 grains of water; gypsum, or plaster, 27 grains; calcareous sand, 29; sandy clay, 40; strong clay, 50; fine calcareous earth, 85; garden earth, 89; and humus 190 grains. Now an acre of soil, twelve inches deep, weighs about 1,200 tons; so that an acre of pure sand a foot deep, resting on the most porous subsoil that can be imagined, would hold 300 tons of water. A sandy clay soil, the same depth, would hold 480 tons; a strong clay 600 tons; a limestone soil 1,020 tons; a garden soil 1,068 tons; while an acre of humus (peat, muck, &c.,) would hold 2,280 tons. It has been determined by experiment, (approximately at least,) that a crop of clover that would yield two tons of hay, has absorbed from the soil, during its growth, 430 tons of water. So that any soil, (except the very lightest sands, which from their porosity absorb much moisture from the atmosphere,) one foot deep, holds water enough to supply the wants of a crop, even should no rain fall during its growth. It must be borne in mind, too, that this calculation is based on one foot of the surface soil, while the drains should be three feet deep; so that, owing to capillary attraction in the soil, even if the roots do not penetrate more than one foot, the plants would be enabled to get much more water than the figures above indicate. There is, therefore, not the slightest danger of making the land too dry.

The profits of underdraining depend principally upon the real value of the land, and upon the price of the products to be obtained from it. If underdraining increases the productiveness of a soil one-third, it is evident that the more valuable the land and the products obtained from it, and the more labor required to produce a crop, the greater the profits of underdraining. Now the products of the garden and the orchard are more valuable than common farm crops, and it follows, therefore, that to the horticulturist and the fruit-grower underdraining offers more than ordinary inducements.

On the thoroughly underdrained soil, the gardener can dig, and sow, and plant, earlier in the spring; the soil, as we have shown, is several degrees warmer, and vegetables and crops of all kinds will grow more rapidly, and mature earlier — no slight advantage — and trees, having a warmer underground climate, and a warmer sap circulating through them, will be able to resist much better the effect of any sudden depression of atmospheric temperature; the wood, too, will ripen more perfectly, and be the better able to withstand severe cold the following winter.

Underdraining has been practiced more extensively and thoroughly

in England than in any other country, and there is a very general opinion that the "weeping skies" of the British Isles renders this more necessary than in the more sunny climate of America. This opinion will not bear examination. Less rain falls in England than in this country, — there are more rainy days, but a less quantity of rain. The land never gets so cold as in this country, and the growing season is much longer.

We have never heard of a single instance, in this country, where underdraining has not proved beneficial, while there are numerous instances on record, where the results have been exceedingly profitable. However useful underdraining may be in England — and that it is eminently so, the extent to which it has been carried out is abundant evidence — theoretical considerations indicate that it would be still more useful in this country; and this opinion is sustained by the results of those who have resorted to it.

There are few farmers in this country that can afford to underdrain all their land at once, but there are none that cannot manage to underdrain at least one acre each year. *Let the work be done thoroughly, as far as it goes.* Commence with the garden and orchard, and the effects will be so marked, and you will acquire such a love for the work, that you will not stop so long as there is a spot of wet land on the farm.

The first thing to be provided for is a good main ditch, that will carry off all the water. If possible, it should be five feet deep. The importance of a good outlet cannot be over estimated. Many of the attempts at underdraining that have come under our observation have failed from neglect of this point. During the rainy seasons, the ditch cannot carry off all the water, and the mouths of the drains are submerged, and the whole network of drains is consequently rendered totally inoperative.

The depth of the underdraining must be regulated by circumstances, the range being from two and a half to five feet. While tiles are high, it is best to cut the drains deep, as they will drain the land on each side to a greater distance. For orchards, too, deep drains are preferable, as the roots of trees frequently penetrate down to shallow drains and choke them up. If sufficient fall can be obtained, we would never drain an orchard or garden less than three and a half to four feet deep.

Where stones are plentiful, and it is an object to get rid of them, it may be more profitable to construct the drains of stones than to use tiles; but under ordinary circumstances, where tiles can be obtained at reasonable rates, they are cheaper than stones. The drains need not be cut so wide for tiles as for stones. A skilful ditcher can cut a drain four feet deep, fifteen inches wide at the surface. R. J. Swan, of Rose Hill, near Geneva, N. Y., who has laid *sixty-one miles* of underdrains on a farm of 344 acres, got his drains dug by contract for 12½ cents per rod; laying the tiles and filling the drains with plows cost three cents per rod; average cost of tiles and cartage, 13 cents per rod. Total cost, 28½ cents per rod. The drains are from two and a half to three feet deep, and on the higher and wetter portions of the farm about 27

feet apart, or an average of sixty-three rods per acre. The cost of thoroughly draining this farm was $19 per acre.

On a small scale, underdraining costs more than the above figures indicate; but when judiciously performed, it is not such an expensive operation as most people imagine.

Much difference of opinion exists as to what shape is best for draining tiles. The *horse-shoe* tile was first introduced, and has still many advocates; but as they require some kind of sole to rest upon in loose soils, we incline to the opinion that small pipes are preferable. *Theoretically*, the oval (fig. 1) is the best form of pipes; but from the difficulty of placing them in the drain expeditiously and properly, we think they are not *practically* so good as the round pipe, (fig. 2,) and which can be made at less cost.

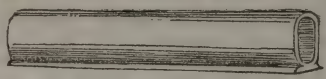


FIG. 1.

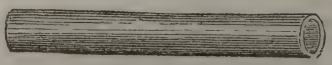


FIG. 2.

In cutting trenches for the reception of pipe tiles, a great improvement has of late years been introduced, by the employment of the bottoming tools (figs, 3, 4.) In clay soils, the trench should be cut of a convenient width for the operations of the workman, to within nine inches or a foot of the total depth; the bottoming tool is then employed to take out the remaining portion, in the form of a narrow spit, of just sufficient size to admit the pipe. By this means, no more work is done in cutting than is required, while the fitting of the pipes to each other is secured. In stony soils, it is impossible to remove so great a depth as a foot in this manner; but, at all events, a few inches should be taken out, so as to secure the steady arrangement of the pipes. Fig. 5 represents a trench cut in clay to receive the pipes, and fig. 6 represents a section of the finished drain.

FIG. 3.

FIG. 4.

Stone drains are very durable and efficient when properly constructed, yet as a general rule they are not as permanent as tile drains. We give cuts of two kinds of stone drains. Fig. 7 shows a drain formed of flat stones, neatly arranged in the bottom of the trench. The largest and flattest stones are used in laying the bottom, and for covers; the smaller ones are placed on the sides; the whole forming an open tube, as represented in the cut. Fig. 8 shows a stone drain, formed by placing

first a flat stone in the bottom of the trench, by way of sole; upon this two other stones are placed, with their lower edges close to the sides of the trench, but having their upper edges resting upon each other. Sometimes two flat stones are placed, one on either side of the trench, without any sole, and having the space between them filled up with stones inserted edgewise. In forming stone drains, the workmen usually throw in all the smaller stones which may be left over after the culvert is formed, disposing them so as to cover up any apertures which may be left between the joinings of the larger stones.

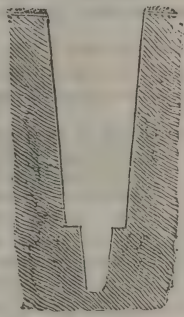


Fig. 5.

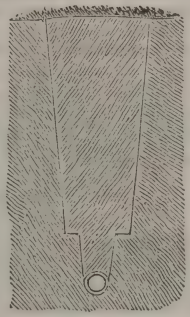


Fig. 6.

In the preceding remarks, we have referred to underdrains principally as carrying off the water which falls on the surface, and which, in spring and autumn, greatly exceeds the amount required by plants. But we must not overlook the fact that on a large extent of country, underdraining is also required to carry off water from springs. These springs are frequently found on the highest and apparently the dryest land. Many persons select side hills for orchards, from an idea that they are well drained, while in fact they are often kept saturated with water which oozes out from springs above them. The following diagrams are introduced here, in the hope that they may aid the readers of the *Rural Annual* in forming some more definite ideas of the nature and origin of springs.

Fig. 7.

Fig. 8.

The crust of the earth is composed of numerous strata, or layers, lying one over the other, some of which, such as gravel and sand, are highly porous and absorbent, and readily permit the passage of water; while others, such as clay and some lime rocks, are nearly or altogether impervious.

When rain falls on a tract of country, part of it flows over the surface, and makes its escape by the numerous natural and artificial courses which may exist; while another portion is absorbed by the soil and the porous strata which lie under it.

Let the following diagram (fig. 9) represent such a tract of country, and let the dark portions represent clay or other impervious strata, while the lighter portions represent layers of gravel, sand, or limestone, permitting a free passage to water. When rain falls in such a district, after sinking through the surface layer (represented in the diagram by a narrow band), it reaches the stratified layers beneath. Through these it still further sinks, if they are porous, until it reaches some impervious stratum, which arrests its directly downward course, and compels it to find its way along its upper surface. Thus, the rain which falls on the space between C and D is compelled by the impervious strata to flow toward C; here it is at once absorbed, but is again immediately arrested by the impervious layer E; it is, therefore, compelled to pass through the porous stratum C, along the surface of E to A, where it pours forth in a stream or forms a swamp.

Fig. 9.

Sometimes, in an undulating country, large tracts may rest immediately upon some highly porous stratum, as from B to C in the annexed diagram (fig. 10), rendering the necessity for draining less apparent; while the country from A to B and from C to D may be full of springs and swamps, arising partly from the rain itself which falls in these latter districts being unable to find a way of escape, and partly from the natural drainage of the more porous soils adjoining being discharged upon it.

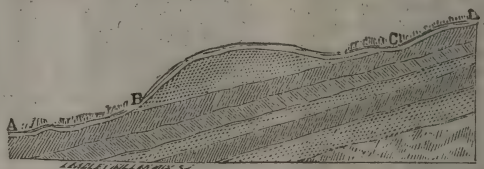


Fig. 10.

Sometimes the strata are disposed in the form of a basin. In this case, the water, percolating through the more elevated ground, collects

in the lower parts of the strata toward the centre, there forcing its way to the surface, if the upper impervious beds be thin; or, if otherwise, remaining a concealed reservoir, ready to yield its supplies to the shaft or boring-rod of the well-sinker, and sometimes forming a living fountain, capable of rising many feet above the face. It is in this way that Artesian wells are formed. The rain which falls on such a tract of country at A and B (fig. 11), gradually percolates toward the centre of the basin, where it may be made to give rise to an Artesian well, as at C, by boring through the superincumbent mass of clay, or it may force itself to the surface through the thinner part of the layer of clay, as at D, there forming a spring or swamp.

FIG. 11.

Again, the higher parts of hilly ground are sometimes composed of very porous and absorbent strata, while the lower portions are more impervious, the soil and subsoil being of a very stiff and retentive description. In this case, the water collected by the porous layers is prevented from finding a ready exit, when it reaches the impervious layers, by the stiff surface soil. The water is by this means dammed up, as shown in fig. 12. It was on such land that Mr. ELKINTON was enabled to accomplish such astonishing results, by cutting off springs by means of a few deep drains, aided by augur holes driven down into the porous watery strata which constituted the reservoir of the springs. The British government awarded him £1000 for a description of the principle upon which his practice was founded.

FIG. 12.

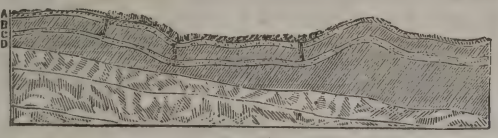


FIG. 13.

In some districts, where clay forms the staple of the soil, a bed of sand or gravel, completely saturated with water, occurs at the depth

of a few feet from the surface, following all the undulations of the country, and maintaining its position in relation to the surface over considerable tracts; here and there pouring forth its waters in a spring, or denoting its proximity by the sub-aquatic nature of the herbage. Such a configuration is presented in fig. 13, on preceding page, where A represents the surface soil, B the impervious subsoil of clay, C the bed of sandy clay or gravel, and D the lower bed of clay, resting upon the rocky strata beneath.

All soils, but especially those containing clay, possess the property of expanding when wetted, and contracting when dried; so that after the drain has removed a portion of the water, a considerable contraction takes place, especially in a dry season; but as the ends of a field cannot approach each other to suit the contraction, both soil and subsoil are torn asunder, and divided into small portions by a network of cracks and fissures. The tendency of draining is to increase and guide the course of this cracking action. The main fissures all commence at the drain, and spread from it in almost straight lines into the subsoil, forming so many minor drains or feeders, all leading to the conduit. These main fissures have numerous small ones diverging from them, so that the whole mass of earth is divided and subdivided into the most minute portions. The main fissures are at first small, but gradually enlarge as the dryness increases, and at the same time lengthen out; so that when a very dry season happens, they may be traced the whole way between the drains. The foregoing cut (fig. 14) will give some idea of this cracking action.

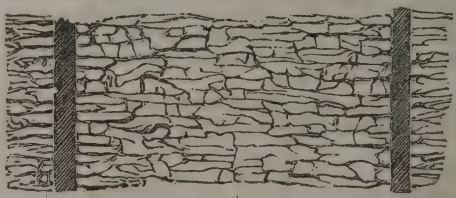


Fig. 14.

When the fissures are once formed, the falling of loose earth into them, and the grooving action of the water which passes through them, prevents them from ever closing so perfectly as to prevent the passage of water; while each successive summer produces new fissures, till the whole body of the subsoil is pervaded by a perfect network of them, which gradually alters the very nature of both soil and subsoil; and in connection with judicious and liberal manuring, has the effect of converting poor old clays into something not very different from a clay loam.

It is easy to see how beneficial such an effect would be for gardens on heavy soils. In fact, it is almost impossible to have a good garden on such a soil without a thorough system of underdraining. When underdrained, such a soil is pre-eminently adapted for pears on the quince stock, and can easily be rendered capable of producing all fruits and vegetables in the greatest perfection.

THE BRITISH BREEDS OF CATTLE.

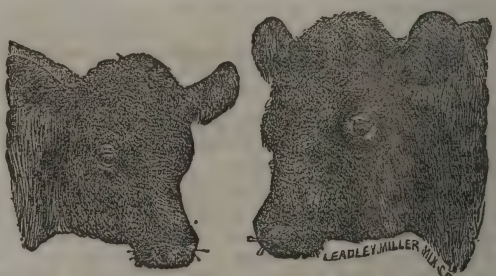
At the suggestion of a friend, we present a short description of the principal breeds of British cattle, accompanied with excellent portraits of the head of the male and female.

West Highland. — Any one who has visited Smithfield Market, must have been struck with the excellence of the West Highland or Kyloes cattle. Their beef is of fair quality, and *commands a higher price per pound than that of any other breed.* They are well adapted to the peculiar climate and herbage of the Highlands. They are some-

West Highland.

what slow in arriving at maturity, but are contented with the coarsest pasturage, and will ultimately fatten where the daintier Durham would barely subsist. The cows yield a rich milk, but give little of it, and soon go dry. Their skin is thick but mellow, and closely covered with shaggy hair. They are exceedingly hardy, and would probably prove a useful breed in the hill districts of the Northern and Eastern States.

Galloways. — Closely allied to the West Highland or Kyloe is the Galloway breed. He is, in fact, a *large Kyloe without horns.* He is more docile, with a greater aptitude to fatten when once his frame is matured, and he is a special favorite with graziers and butchers, from the fact that the parts of his carcass used for roasting are largely developed. In rich pastures, he cannot compete with the Short-horn for early maturity or fattening properties; and for the dairy he has been supplanted in his native district by the Ayrshires; but in those districts where the rearing of grazing cattle is found the more suitable practice, the Galloways still reign unrivalled. They are not quite so hardy as the West



Galloways.

Highland, but much more so than the Short-horn, Hereford, Ayrshire, or the Devon. They are good handlers, but are covered with long, black, shaggy hair, and their hides would make superior substitutes for buffalo robes. They have been imported into Canada, and will no doubt prove an acquisition. They should be kept as a distinct breed.

SHORT-HORNS OR DURHAMS. — The "Improved Short-horns" originated on the banks of the Tees, some seventy years ago. The cattle of this district were large, coarse, and ungainly, — generally deficient in the fore quarters, with strong shoulders; they fatted slowly, and the meat was coarse to the palate and uninviting to the eye. The brothers CHARLES and ROBERT COLLINGS undertook the task of improving them. It is to their patient skill in selecting, and perseverance in breeding, and to their famous bull "Hubback," calved in 1777, and bought out of a by-lane for $40, that the present breed of Short-horns owe their great and just celebrity. Such was the great improvement produced

Short-Horns.

by these breeders, that at CHARLES COLLINGS' sale in 1810, his herd of forty-seven animals brought £7,115.17, say $35,579, or $767 each; and at ROBERT COLLINGS' sale in 1817, his herd of sixty-one animals

brought £7,858.4, say $39,291, or $644 each. So much for persevering and judicious breeding.

These two sales dispersed the improved Short-horns, and at the present time there are some five or six hundred herds in Great Britain, and from six to seven thousand head registered every alternate year in the Herd Book. Pure blood animals of this breed are now found in nearly every country of continental Europe. In Canada and California, in New Zealand and New Brunswick, in America and Australia, the Short-horn quietly crops the luxuriant herbage, and furnishes "the roast beef of old England" to the inhabitants of every clime. The influence of this breed it is hardly possible to over-estimate. In the language of a high authority, "the Short-horns improve every breed they cross with."

The most remarkable characteristic of the Short-horns, is the rapidity with which they mature. In England, vast numbers are now slaughtered at two years old and under, weighing from 800 lbs. to 1000 lbs. On rich soils, no breed can compete with them in this respect.

Ayrshires. — The peculiar function of this breed is the dairy, for which, on medium soils, it cannot be surpassed. The Ayrshire has

Ayrshires.

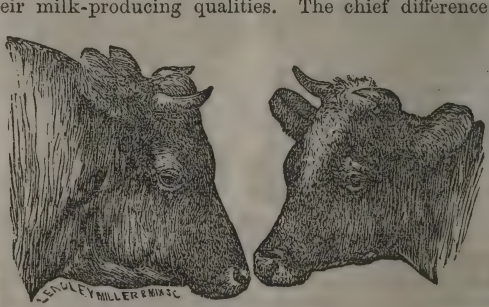
little aptitude to fatten, and the beef is rather coarse. A cross with the Short-horn, however, makes a useful grazing animal. In the west of Scotland this cross is resorted to on a large scale, with great success.

Herefords. — The general characteristic of this breed, as regards color, is light or dark red, with a white face — frequently with white marks on the neck and along the back, and also the under parts of the body. The Hereford for many years held the first rank among the grazing cattle of England. It is now generally admitted, however, that the Short-horns mature earlier, and they have, to a considerable extent, driven the Herefords out of their native districts. In the rich meadows on the banks of the Severn they are still numerous, and it is undoubtedly true that to buy (not to rear) and sell again after fatten-

Herefords.

ing, they are the most profitable breed. They are better "handlers" than the Short-horns, and afford more first quality beef. In England, both Herefords and Short-horns have been so long bred exclusively for the butcher, that they are ordinarily but indifferent milkers; but in both breeds there are some strains which possess excellent milking qualities. The Herefords are worthy of more attention than they have hitherto received in this country.

Alderney or Jersey. — In appearance, this breed somewhat resembles the Ayrshires, and it is conjectured that the latter are indebted to it for their milk-producing qualities. The chief difference between



Alderneys.

them is, that the forte of the Ayrshires lies in the *abundance* of their milk; that of the Alderneys in the *richness* of the quality. For ordinary dairy purposes they are inferior to the Ayrshires.

Long-Horns. — Time was when this was one of the principal breeds in the midland counties of England, as they still are in some parts of Ireland; but notwithstanding this wide diffusion, and the comparative excellence to which they were brought by the genius of Bakewell,

Long-Horns.

they are so unquestionably inferior to the Short-horns, that they have rapidly given place to them, even in those districts in which they have been brought to the greatest perfection.

Devons. — The Devons, or more correctly the *North Devons*, constitute an original breed of, perhaps, the longest standing of any distinct breed of cattle in England. It is recorded as having been esteemed for its good qualities for centuries. There is scarcely any breed of cattle so rich and mellow in its touch, so silky and fine in its hair, or so handsome in appearance. It is said that "they have a greater proportion of weight in the most valuable joints, and less in the coarse, than any other breed, *and also consume less in its production.*" As working oxen they generally surpass any other breed. They are excellent

North Devon.

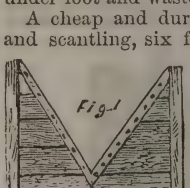
walkers, and perfectly docile. An English author says, "As milkers they are about the same as most other breeds, the general average of a dairy of cows being about one pound of butter per day for each cow

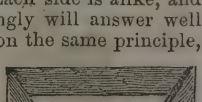
during the summer months; although in some instances the very best bred cows give a great deal more." For general purposes — for the yoke, the dairy and the butcher combined, they are probably the most profitable breed of cattle for poor and medium soils. On the rich soils of the West they cannot compete with the Short-horns for beef; neither can they compete with the Ayrshires for exclusively dairy purposes; but on the poor soils of New England, for ordinary farm purposes, they are unsurpassed by any other breed at present introduced. Where known, the Devon is justly admired for his pleasing color, elegant form, agile gait, and gentle temper.

MOVEABLE FEEDING RACKS.

Notwithstanding the acknowledged economy of feeding domestic animals in stables, from properly constructed racks and mangers, there are many times when it is inconvenient to accomplish this, however much desired. On many large stock farms, with herds of young cattle, it would not only require much stable room, but render necessary a large amount of labor in transporting the hay from a distant field to the barn, and returning — as good farmers do — the manure to the field from which the crop was taken. In good weather, it is not objectionable to feed cattle and sheep in the yard, and sheep are usually fed under sheds. In either case, it will be economical to have well arranged racks and boxes, that none of the fodder may be trampled under foot and wasted.

A cheap and durable rack for this purpose may be made of boards and scantling, six feet square, as shown in fig. 1, which shows one side. The posts are four-by-four scantling, and the horizontal scantling, *a*, two by four inches. A botom may be laid on this, or it may be filled to this level with straw. Each side is alike, and when nailed together strongly will answer well for years. Another form, on the same principle, may be constructed by having for posts four-by-four scantling, the lower or base boards two feet wide, the top board and braces ten inches wide, of hard wood, well nailed together with wrought nails. Fig.-2 shows only one side, as in the first instance. Six feet square will accommodate four head of cattle, so they can eat without disturbing each other.





Still another rack, designed more especially for feeding corn stalks, may be made by taking two good planks and rounding them off at each end, in the form of a wood-sled runner, and framing in cross-pieces

three and a half or four feet long, forming a sled that can be moved either end first. A rack twenty inches high is made on this, by boring inch and a quarter holes in the top of each side, into which stakes are put, with a four-by-four scantling on top, in like manner, with cross-pieces at each end. One nine feet long will hold a shock or two of corn-stalks, and may be drawn on some knoll or under a shed, where the stalks can be consumed without waste.

For feeding sheep, racks of different forms are constructed, answering an excellent purpose. We give here a sketch of one constructed on runners, (fig. 3,) which may be made of three-inch plank, fourteen

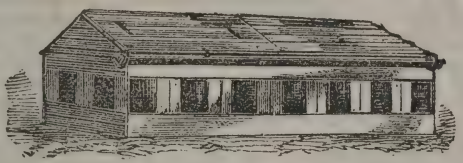


Fig. 3. — Sketch of a Sheep-Rack.

feet long, and four feet wide; sleepers, four-by-four, are framed into the runners, and the floor of the rack nailed to them. A post, three-by-three inches, at each corner; on the inside of the rack the boards are made fast to them. The bottom boards four feet wide, the space nine inches. The top board sixteen or eighteen inches; the edge of the boards rounded and made smooth. To divide this space, boards ten or twelve inches wide should be used, with the edges made smooth, nailed on the outside. The space for each sheep's head will be seven by nine inches. The roof is made of boards and small rafters, two by two inches. One half of one side of the roof must be hung by strap hinges, (to prevent its warping,) that can turn up, with a small latch to hold it up when filling with hay. An eave-trough, made of two boards, to carry the water off, can be hung at each corner with old chains on hooks, and let down and answer a good purpose for feeding grain to the sheep.

To Preserve Cherries without Sugar. — Take the common red cherries, and remove the stones. Put them in wide-mouthed glass bottles. Then set the bottles in a boiler of cold water, within an inch or so of the neck. Let them boil from fifteen to twenty minutes. Put the corks in the bottles as tightly as possible, while the water is boiling. Then take out the bottles, tighten the corks, and seal them with a wax made of equal quantities of rosin and beeswax. The reason why the bottles are placed in cold water, is to prevent them from breaking. If tin cans are used, there will be no need of this precaution.

Green gooseberries and currants may be preserved in the same way, except that they do not need so much boiling.

CULTIVATION OF RUTA BAGAS.

THE culture of ruta bagas, or Swede turnips, is gradually increasing. The general introduction of improved stock, and the necessity of furnishing them some succulent food during the winter, induces more attention to the cultivation of root crops. There are at the present time eleven varieties of ruta bagas commonly cultivated in England. We here present engravings of three of the best of them. The *Common Purple Swede* (fig. 1,) is one of the oldest varieties. It is very solid in texture, hardy, and not apt to run to seed. It grows deep in the ground, and requires a black or loamy soil, of considerable depth. *Skirving's Improved Purple-top Swede* (fig. 2,) was originated by Mr. WILLIAM SKIRVING, of Liverpool. It is a very popular variety in England, and has been extensively introduced into this country. It differs from the former in the more oblong shape of the bulb, having a longer neck, and standing more out of the ground. *It is also more liable to run to seed in the fall,* — a great drawback in this country. It also contains, according to an analysis made by the writer at Rothamstead, *less dry matter* than any other variety of ruta bagas that we are acquainted with. In fact, fifteen tons of the common ruta baga contained as much nutritious matter as twenty tons of this improved variety. On the other hand, it is a very free grower, comes early to maturity, and keeps well when stored. It is a good variety to sow on thin solis and on hard clays, because of the slight hold it requires of the ground. *Laing's Improved Purple-top Swede* (fig. 3,) differs, according to LAWSON, "from all hitherto known varieties of Swedish turnips, in having entire cabbage-like leaves, which, by their horizontal growth, form a thick covering to the soil, thereby materially checking the growth of autumnal weeds." In point

FIG. 1.

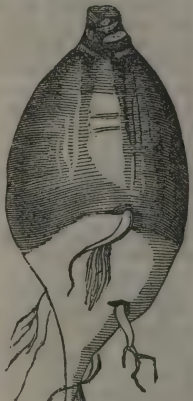


FIG. 2.

of shape, hardiness, and quality, it is superior to all other varieties. It grows late in the autumn, and is not suited to a climate where winter sets in early. It has little or no tendency to run to seed in the fall, and even in the spring, when set out for seed, it is a fortnight later in commencing this function than any other variety of ruta bagas. It requires good land, in high condition, and under such circumstances as have been mentioned, its cultivation is strongly to be recommended.

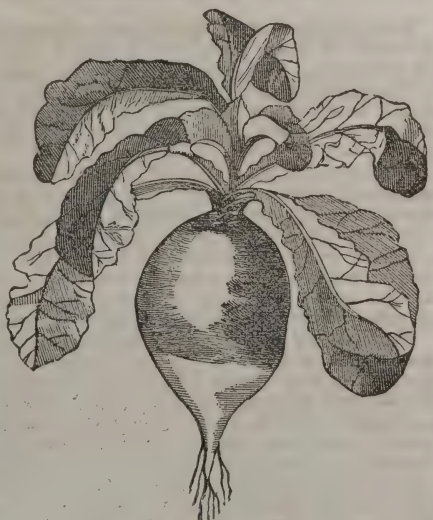


FIG. 8.

The dry, hot summers of this country are not as favorable for the growth of ruta bagas as that of Western Europe, and especially of the British Isles. Neither are our cold winters so favorable for storing and feeding them. The main reason, however, why this crop does not usually succeed better in this country, is owing to negligent cultivation. Ruta bagas must have good cultivation and plenty of room. Sow in drills, 2 feet to 2½ feet apart; do not spare the seed — sow so thick that the flies cannot take *all* the plants — say 2 lbs. per acre; then thin out the plants to 12 inches apart in the rows. Keep the cultivator going between the rows, and do not suffer a weed to be seen.

A correspondent of the *Genesee Farmer*, who cultivated thirty acres of ruta bagas last year, adopts the following method: Plow the land in the fall very deep; during the winter draw manure into the field and put it into a round heap, with a flat surface to catch all the rain. As soon as the ground is in working condition in the spring, plow again; work down fine with cultivator and harrow, and about the first week of June commence ridging twenty-eight inches apart; fill the ridges with good rotten dung; roll down with a light roller, and from the 10th to the 20th of June drill in about a pound of seed per acre. When the plants are nicely in rough leaf, go through them with scuffler or horse hoe; then hand hoe, leaving the plants twelve inches distant from each other — if the ground is very rich a little more.

When the plants have got a little hold of the ground, scuffle again. and go over them with the hand hoe, cutting out all weeds and double turnips. He considers turnips and ruta bagas the most profitable crop the farmer can raise.

THE JERUSALEM ARTICHOKE.

The true Artichoke — *Cynara* of the botanists — is a perennial from the south of Europe, naturally a marine plant, and greatly improved by cultivation. It resembles a gigantic thistle, and its flower-heads, before blossoming, have somewhat the appearance of a small pine apple; at which time—cooked like asparagus—they are highly prized on European tables. The plant is too tender for the open air here, and hence is seldom cultivated in this country.

The Jerusalem artichoke—*Helianthus tuberosus*—is a species of small sun-flower, found wild in some parts of South America, and from thence, in 1617, carried to England. Loudon says that the name Jerusalem is a corruption of the Italian word for sunflower—*girasole*,—and artichoke was probably derived from a resemblance in taste to that plant. It bears a potato-shaped tuber, valuable as food for animals, and not unpalatable to man; not proving, however, as was thought upon its first introduction, an esculent superior to the potato.

The stalks of this plant on rich soils frequently attain a height of eight or ten feet, and the product of roots is sometimes half a bushel to a hill, or from fifteen hundred to two thousand bushels per acre. The soil and cultivation are very similar to that for potatoes, and when once fairly established on a light loam, they are with difficulty eradicated. Hogs, it is said, will effectually root them out, if allowed free access to the land upon which they are planted.

The tubers may be dug late in autumn, or left in the ground over winter, as the artichoke will bear freezing in the earth without injury. The tops have been grown for fodder, and producing largely, are thought an excellent article for that purpose. They are mown while in flower, and made into hay; and an Ohio farmer who tried the experiment, says he got about six tons per acre, much liked by his stock, and upon which they throve well. The crop withstood a severe drouth without injury, and does not require extra quality of soil in order to productiveness.

Artichokes have been grown profitably for swine; the animals are very fond of them, and thrive upon them as a winter food. Some who have grown them recommend planting a patch for feeding store hogs in spring, turning them on to dig for themselves. For horses they are found equal to carrots as a condiment, having an effect like oil-cake upon the coat and spirits. Cows and sheep will also eat them readily.

As an article of human food, the artichoke is eaten raw or boiled, and is relished by many persons. When gathered fresh in the spring,

they may be sliced thin and eaten with vinegar, or pickled whole, and we have often eaten them, with much relish, when prepared in this manner. To cook them they are boiled tender, and then peeled and stewed with wine and butter. Many persons like them thus prepared. We would commend them anew to the attention of farmers and gardeners, both for stock feeding and culinary purposes.—J. H. B.

SPECIMEN OF AMERICAN LANDSCAPE AND GARDENING.

We extract from Downing's *Landscape Gardening and Rural Architecture*, the accompanying engraving of the beautiful cottage residence of W. H. Aspinwall, on Staten Island. It is a fine specimen of American Landscape Gardening.

The house is in the English cottage style, and from its open lawn in front, the eye takes in a wide view of the ocean, the Narrows, and the blue hills of Neversink. In the rear of the cottage the surface is much broken and varied, and finely wooded and planted. In improving this picturesque site, a nice sense of the charm of natural expression has been evinced; and the sudden variations from smooth, open surface, to wild, wooded banks, with rocky, moss-covered flights of steps, strike the stranger equally with surprise and delight. A charming greenhouse, a knotted flower-garden, and a pretty, rustic moss-house, are among the interesting points of this spirited place.

THE SCARLET FLOWERED HORSE CHESTNUT.

As an ornamental tree, the common horse chestnut holds a high rank. In point of floral beauty, it is unequalled by any tree of equal size that will endure our northern winters. It is easily propagated from seed, and its rapidity of growth and ample foliage render it desirable as a shade tree.

The *Scarlet-Flowered* horse chestnut is a smaller tree than the common horse chestnut, and of a less vigorous growth. It flowers at an earlier age, and the leaves are of a deeper green. LOUDON says: "It is without doubt the most ornamental tree of the genus."

DUCKS, GEESE, AND SWANS.

HINTS ON THEIR HISTORY, CHARACTERISTICS, AND GENERAL MANAGEMENT.

WRITTEN FOR THE RURAL ANNUAL, BY C. N. BEMENT.

IT is an old, and nevertheless true maxim, that "the thing which is worth doing at all, is worth doing *well*," and this may be well applied to the keeping of ducks, geese, and other small stock, which too often, if kept at all, are a pest and nuisance, and a positive loss to the cottager and farmer, when they could by a little attention be made a source of much pleasure, comfort and profit. To attempt to show the way in which this desirable object may be attained, is the proposed effort of this essay.

The *anserine*, or web-footed species of domestic fowls, comprises the Duck, the Goose, and perhaps the Swan; of the two former there are upwards of one hundred varieties, differing considerably in size and plumage, yet very few have been domesticated. The ancients were very great admirers of them, and highly esteemed their flesh, ascribing to it certain medical properties. We are told by Plutarch, that Cato preserved his whole household in health by dieting them with duck's flesh as a prophylactic. Several of the Roman medical writers have descanted on its merits, and recommend it for promoting longevity. As they were greater epicures than the moderns, we may feel surprised that while esteeming the Duck so great a dainty, they abstained from the flesh of the Goose. The Duck possesses many excellent recommendations: it is mild and quiet in its manners, cheaply and easily provided for: hardy and very prolific, — laying a great number of very large eggs, and commencing quite early in the season.

As regards the origin of the common domestic Duck, but one leading opinion seems to have prevailed, viz: that it is nothing more than the tame descendant of the Mallard (*Anas Boschus*) of Europe. One thing is certain, — the wild and tame will freely intermix, and the progeny partake rather more decidedly of the habits and manners of the former, than of the latter. There are, indeed, many points irrespective of the varied colors in our domestic breeds, in which the tame and wild duck differs. For instance, the tame duck is polygamous, but the wild species mates. Again, the feet of the wild duck are black,

while those of the tame varieties are flesh-colored or red. The early voyagers speak of finding them in the East Indies, exactly similar to ours; and the transmission of a few pairs would be a much easier task than to subdue the shyness and wildness of the Mallard.

The common Puddle Duck is so well known that it needs no description. It is generally dark brown, and the wings and throat sometimes ornamented with changeable purple. The drakes of all sorts may be known by the curled feathers over their tails. They are rather larger, and the flesh is more savory than the White Aylesbury. But there are common ducks of a white color. They are good layers, good nurses, and hardy. We have known one to have laid an egg every morning for eighty-five successive days. Their young should not be allowed to go to the water too early, particularly if there are turtles, eels and bull-frogs in the pond, as they will devour the young ducklings when very small. We were once passing near a stream of water running through our meadow, and hearing the cries of a duck, we hurried to the bank and found it bobbing up and down, its feet apparently entangled; on grasping it we found something heavy hanging to one foot, and on raising it out of the water, behold, a snapping-turtle had fastened to one of its legs, to which he adhered with the tenacity of a bull-dog. To show that even in their own congenial element, when skimming the surface of the water, under the watchful care of their mother, the ducklings are not free from danger, the following is told by WATERTON:

"In 1815," he observes, "I fully satisfied myself of the inordinate partiality of the carrion crow for the young aquatic poultry. The duck had in her possession a brood of ten ducklings, which had been hatched about a fortnight. Unobserved by anybody, I put the old duck and her young ones into a pond, nearly three hundred yards from a high fir-tree, in which a carrion crow had built its nest; it contained five young ones, almost fledged. I took my station on the bridge, about one hundred yards from the tree. Nine times the crow flew to the pond, and brought back a duckling each time to its young: I saved a tenth victim by timely interference. When a young brood is attacked by an enemy, the old duck has nothing to defend it. In lieu of putting herself between it and danger, as the dunghill fowl would do, she opens her mouth and shoots obliquely through the water, beating it with her wings. During these useless movements, the invader seizes her prey with impunity."

The following has been related to us as fact: — There was a goose, which by some accident was left solitary, without mate or offspring, gander or gosling. Now, it so happened, as is common, that a hen was set with a number of duck's eggs, which in due course of time were hatched: and of course, the ducklings, as soon as they came forth, ran with natural instinct to the water, and the hen, as may well be supposed, was in a sad pucker — her maternity urging her to follow the brood, and her selfishness disposing her to keep on dry land. In the meanwhile, up sailed the goose, and with a noisy gabble, which

certainly (being interpreted) meant "leave them in my care," she swam up and down with the ducklings; and when they were tired with their aquatic excursion, she consigned them to the care of the hen. The next morning down came again the ducklings to the pond, and there was the goose waiting for them, and there stood the hen in her great flustration. On this occasion, we were not at all sure that the goose invited the hen, observing her maternal trouble, but it is a fact, that she being near the water, the hen jumped upon her back, and there sat, — the ducklings swimming, and the goose and hen after them, up and down the pond. And this was not a solitary event. Day after day the hen was seen on board the goose, attending the ducklings up and down, in perfect contentedness and good humor. This continued until the ducklings, coming to the days of discretion, required no longer the joint guardianship of the goose and hen.

Ducks being aquatic in their habits, most persons suppose they ought to give the young ones a great deal of water. The consequence is, they often take cold, become droopy, and die. This should be avoided. Ducks, when first hatched, are always inclined to fever, from their pinion wings coming out so soon. This acts upon them as teething does on children. The young ducks should consequently be kept from everything which may have a tendency to create cold in them. To prevent this, therefore, we always give our young ducks as little water as possible. In fact, they should only have enough to allay their thirst, and should on no account be permitted to play in the water. If the person lives near a city, liver and lights should be procured, and these should be boiled and chopped fine, and given to the young ducks. Or if fish, crabs, oysters or clams can be procured, these should be given. In case none of these can be obtained, all the victuals should be boiled before feeding. Boiled potatoes, mixed with coarse Indian meal or hominy, are also excellent. Half of the ducks which are lost, die because raw food is given them. To sum up all in a word, if you wish to raise almost every duck that is hatched, give them little water, and feed them on no food which is not boiled. By observing this plan, we raise for market and our own table, between two and three hundred ducks every year.

Ducks, when young, are exposed to many dangers and mishaps. Their waddling gait unfits them from running from a fox on land, and they are but too apt to be trodden on by horses, cattle, and even by the foot of man. Care must be taken that the water where they are at liberty to go contains no leeches, which occasion the loss of the ducklings by sticking to their feet.

The young ducks seldom die of disease, and if cats and rats are exterminated, there will be no trouble in raising almost as many ducks as you have eggs. Last year, from ninety eggs, we had eighty-seven hatched, and raised eighty-three ducks. These were mostly Musk or Muscovy ducks, as they are commonly and erroneously called. Ducks come early to maturity, being nearly full grown and in fine eating order at four months old; far excelling, in this respect, all other poultry.

A few ducks should be kept on every farm, for their services as grub-destroyers, for the beauty of their plumage, and for the pleasure of seeing them swim their minuets in the pond, bowing politely to each other — the bows to be returned before they take their afternoon's doze on the grass, with their sleepy eye-lids winking *from below*, and their bills tucked under the feathers of their backs, by way of a respirator.

The manners and actions of the duck, whether upon land or water, are curious and pleasant to contemplate. Their regular afternoon parade and march in single file, the elder drakes and ducks in front, from the pond homeward, is a beautiful country spectacle, to be enjoyed by those who have a relish for the charms of simple nature. A parcel of ducks, which had been accustomed to their liberty, were for some particular reasons shut up for several hours. On the door of their house being opened, they rushed out, threw themselves into rank and file, and marched with rather a quick step three or four times round a certain space, constantly bowing their heads to the ground, then elevating them, and fluttering their wings. The ceremony finished, they quickly adjourned to the water. We have laughed a thousand times, at the conceit with which our boyish imagination was impressed, namely, that the act we had witnessed was nothing less than a duckish thanksgiving for their deliverance.

It is not in all situations that common ducks can be kept with advantage; they require water much more, even, than the goose; they are no graziers, yet they are hearty feeders; — nothing seems to come amiss to them; they are carnivorous as well as granivorous; they will thrive on flesh and garbage of any kind, like the chicken, yet water insects, frogs, weeds, vegetables, corn, oats, and peas, are their general food. They are also very fond of fish, and will greedily devour it even when part decomposed; a dead rat is a feast for them; these of course will impart a bad flavor to the flesh, if continued, but their feeding on the young frogs will improve it, — and why not? Do not the French make a delicious dish from the thighs or saddle of the bull-frog, *fried a la mode?* The offals of the kitchen, meal of all sorts made into paste, grains, bread, animal substances, worms, slugs, tadpoles, snails, insects and their larvæ, are all eaten with eagerness. They never need cramming — give them enough and they will cram themselves; yet they have their requirements, and ways of their own, which must be conceded. Confinement will not do for them: a paddock, a pasture, an orchard, a green lane and a pond; a farm-yard, with barns and water; a common, smooth and level, with a sheet of water, and nice ditches, abounding in the season with tadpoles and the larvæ of aquatic insects, are the localities in which the duck delights, and in such are they kept at little expense. They traverse the greensward in single file, and thus return at evening to their dormitory, or emerge from it to the edge of the pond or sheet of water, over which they scatter themselves; thus also they come to the call of their feeder.

COMPARATIVE COST AND PRODUCE OF DUCKS.

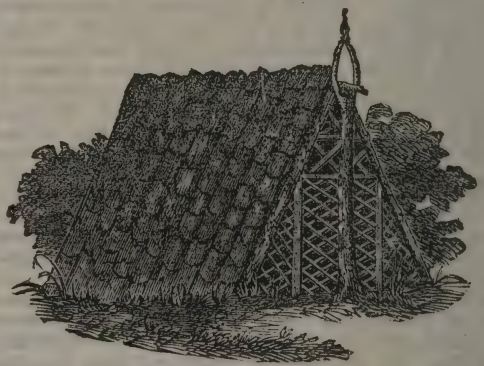
Any calculation as to the return to be expected by those who keep ducks, turns entirely on the possession of a suitable locality. They are most likely to be kept with profit, when access is allowed them to an adjoining marsh or water meadow, where they are able, in a great measure, to provide for themselves; for if wholly dependent on the breeder for their living, they have such ravenous, insatiable appetites, that they would soon, to use an emphatic phrase, "eat their heads off." No description of poultry, in fact, will devour so much, or feed so grossly. But certain moderate limits are necessary for their excursions, for otherwise they will gradually learn to absent themselves altogether, and acquire semi-wild habits, so that when required to be put up for feeding, or immediate sale, they are found wanting. Ducks, too early allowed their liberty on large pieces of water, are exposed to so many enemies, both by land and water, that few reach maturity; and even if some are thus fortunate, they are ever after indisposed to return to the discipline and regular habits of the farm-yard. They may be kept in health in small enclosures, by a good system of management, though we fear not with profit — which is the point to which all our advice must tend.

There are several varieties of tame ducks, but their merits are more diverse in an ornamental than in a profitable point of view, and will be estimated very much according to the taste of individual fanciers. Those who merely want a good supply for the table, cannot probably do better than just adopt the sort most common in their own vicinity. No country place should be without some, especially in low situations. A drake and two or three ducks will cost but little to maintain, and will do incalculable and unknown service by the destruction of slugs, snails, worms, and the larvæ of gnats and other annoying insects. The only trouble they will give, is, that if there be much extent of water or shrubbery about their home, they will lay and set abroad, unless they are got up every night and confined, which should always be done; otherwise they will drop their eggs carelessly here and there, or incubate in places where their eggs will be sucked by carrion crows or skunks, and half their progeny destroyed by weazels or rats. In the neighborhood of large pieces of water, or wide-spreading marshes, this will be either impossible, or attended with more waste of time than the ducks are worth.

Ducks are much more prolific than they have credit for, and even for eggs, can be made a profitable bird, if well fed and properly managed. Any common duck, so treated, if not old, will yield in a season one hundred or more large, rich, and delicious eggs. When they lay, it is daily or nightly, and if kept from setting, (which is easily done by changing their nests frequently,) they will lay with little interruption, from March until August. But the trouble is, a duck lays only when eggs are most abundant, while hens' eggs may be procured at all seasons.

A single drake is sufficient for six to eight ducks. If well fed in

winter, and lodged in a comfortable, dry place, they begin to lay the latter part of March or first of April. They must then be closely looked after, for they are very careless, and deposit their eggs wherever they happen to be — in the water, in the shady and secluded places, even after having concealed them from the person who has care of them; they hatch them secretly, and some fine morning bring their young brood to the house to ask for food, without requiring further trouble. It is prudent, when the spring is at hand, to give them food three or four times a day, but little at a time, but always in places where it is wished they should lay, and in placing their nests where they once have lain.



THE DUCK-HOUSE.

Where they are kept in considerable numbers, they should have accommodations of their own. The duck-house must be secure at night against prowling animals, such as foxes, skunks, weazels, and minks. The walls and roof should be low and thickly thatched with straw, for warmth in winter, with the necessary openness for ventilation, and ingress and egress of the ducks. The construction of a piece of rustic work like the above figure, (which we take from *Brown's Poultry-Yard*,) after selecting the situation, can easily be made by any person accustomed to the use of the saw and an axe. All that is required is a little taste, having your plan well digested before commencing, so as to require no alterations. Join four pieces of saplings in an oblong shape for the sills; confine them at the ground, erect at the middle of the two ends a forked or crotched post, of suitable height, in order to make the sides quite steep; join these with a ridge-pole; rough board it from the apex downward by the sills to the ground; then cover it with bark, roughly cut in pieces a foot square, laid on and confined in the same manner as ordinary shingles; fix the

back end in the same way; and the front can be latticed with small poles with the bark on, arranged diamond fashion, as shown in the sketch — a part to be made with hinges for a door.

Something like this, placed on a bank, or small island of a lake, pond, or small stream, and half covered with vines or shrubbery, would make a very pretty home for aquatic birds. The size of the building may vary according to the wants of the owner. Laying and setting boxes may be placed at either or both sides of the building, under the roofing, on the ground.

They should have a place separate from other fowls, on account of the great difference in their habits. When circumstances will permit the arrangement, we recommend having the house adjoining the pond, which should be enclosed. The laying ducks should have plenty of room, for the sake of cleanliness, and should never share the habitations of geese, as the ducks are liable to persecution. When accustomed to be fed in the house, they readily present themselves at the proper time; in the morning they get their feed apart from the geese and fowls — in which case they are not persecuted by the former, nor pilfered by the latter; and thus, too, their eggs are secured with far greater certainty, since the birds are not released from their enclosure till after the hour which usually witnesses the deposit of their eggs. The duck generally lays at night, or early in the morning, and is usually disposed to lay away from her house; but by our plan many eggs are secured which otherwise would have probably been lost.

A strong desire for the selection of her own nest, is generally found to influence the duck; but this is mainly the case as the time draws near for incubation. Wood is seldom secure against rats, and does not so well suit the cleansing process of water and the lime-brush, and few places require their application more frequently.

Do not crowd your birds, and always arrange for good ventilation. When the flock is large, separate the young ones, that they may thus have the advantage of better food, and that no risk may be incurred of finding the eggs of the older ones trodden under foot and broken, at your morning's visit. On this account, the laying ducks should always have plenty of room, and be kept by themselves. Ducks for these reasons, as well as for the sake of cleanliness, should never share the habitations of fowls, and from geese they are liable to persecution.

REARING AND FEEDING THE YOUNG.

The best mode of rearing ducklings depends very much upon the situation in which they are hatched. On hatching, there is no necessity of taking away any of the brood, unless some accident should happen; and having hatched, let the duck retain her young upon the nest her own time. On her moving with her brood, prepare a coop and pen upon the short grass, if the weather be fine, or under shelter, if otherwise; a wide and shallow dish of water, often to be removed, near by them. Their first food should be crumbs of bread moistened with milk; curds, or eggs boiled hard and chopped fine, are also much

relished by, and are good for them. After a few days, Indian meal *boiled* and mixed with milk, and if boiled potatoes, and a few cives or lettuce chopped fine be added, all the better. All kinds of sopped food, buckwheat flour, barley meal and water mixed thin, worms, &c., suit them. As soon as they have gained a little strength, a good deal of pot-herbs may be given them, raw, chopped fine, and mixed with a little bran soaked in water, barley and boiled potatoes, beat up together. They are extremely fond of angle-worms, grubs, and bugs of all kinds, and for which reason they may be useful to have a run in the garden daily. All these equally agree with young ducks, which devour the different substances they meet with, and show, from their most tender age, a voracity which they always retain. No people are more successful in rearing ducks, than cottagers, who keep them for the first period of their existence in pens two or three yards square, feeding them night and morning with egg and flour, till they are judged old enough to be turned out with their mother to forage in the field.

It is necessary, to prevent accidents, to take care that the ducklings come regularly home every evening; and precautions must be taken, before they are permitted to mingle with the old ducks, lest the latter ill-treat and kill them, — though ducks are by no means so pugnacious and jealous of new-comers, as common fowls uniformly are.

VARIETIES OF THE DUCK.

THE MALLARD DUCK.

It is generally supposed that the *Mallard*, or *Wild Duck*, is the original from which our domestic bird sprang. It is widely spread over the northern parts of Europe and America. It is commonly found about most of the lakes in the interior of the State of New York, and has been observed from Mexico to the 68th parallel. In the fall it migrates to the South, where it winters. Eminent naturalists of our own and other countries, acquiesce in the supposition that the domestic duck derived its origin from the Mallard; but other writers on the subject hold a different opinion. A Mr. WILLIAMS, in a note to the authors of the English "Poultry Book," says, "I do not think that our domestic varieties of ducks are descended from the wild. At farm-yards there often occurs a cross between the two, and I have known the wild birds kept by gentlemen whose property adjoins mine. These never altered either in color or habits, many of them flying away unless pinioned."

The Mallard Duck.

Dixon, in his work on poultry, has the following passage in strong corroboration of the opinions that have been expressed: "I know of no instance in which any one has finally succeeded in founding a permanent, tame, farm-yard race of ducks, by breeding from the Mallard, though the attempts have been numberless, and a few parties have been on the very brink of success. Crosses between the wild and tame breeds have answered better; but the progeny have retained their full share of independent temper and movements."

The Mallard is very widely diffused over the continental parts of the Old and New World, and therefore, its supposed adaptation to domestic life is as likely to have occurred in Asia as in Europe or America. The Mallard, though not gone, is said to be fast diminishing in England; the tame duck, so much larger and heavier, if its descendant, can hardly be called a degenerate one.

One of the most valid arguments in favor of the derivation of the tame duck from the Mallard, is to be found in the readiness with which the former returns to a wild or half-wild state. In Norfolk, England, there is a breed called "Marsh Ducks," more from their habits and place of birth than from any peculiarity of race. They are mostly of plumage similar to the Mallard, though an ornithologist would immediately distinguish them; their size and the firmness of their bones are intermediate between the wild bird and the common farm-yard duck. They are turned out on the marshes to forage for themselves: indeed, it would be next to impossible to keep them at home.

THE ROUEN DUCK.

Though little can be elicited as to the origin of the tame duck, we still possess birds in this class presenting features quite as distinct as any in the various races of fowls, and even to a greater extent than appears in geese. These varieties may be stated thus: The common Farm-yard Duck, The Rouen Duck, The White Aylesbury Duck, The Black East Indian or Buenos-Ayrean Duck, and The Musk or Brazilian Duck. Of all the duck tribe, we give preference to the Rouen, of which the annexed figure is an illustration, as it seems the most useful, and we have no doubt under ordinary circumstances, it will be found the most profitable variety; and at the same time very few, if any, but will admit that for beauty of plumage, none of the tame varieties excel, or even equal them. Its plumage is of great richness, which we will at once admit is of minor consideration in a bird whose merits must be mainly weighed by its value as an economical inhabitant of the poultry-yard; but where both these recommendations can be combined, there are few persons who would not be desirous of so uniting them.

The Rouen Duck.

The Rouen, now in most request, derives its name from a city on the river Seine, in France, and is esteemed by epicures. It is a prolific bird and lays great numbers of large eggs, of which the average weight is three and a half ounces — never less than three ounces. Its size is the criterion of its value; the flesh is of the highest possible flavor, and in first-rate specimens the supply is most profuse, for a drake and three ducks not unfrequently weigh twenty-six pounds. Young drakes of only nine or ten weeks old have been known to weigh (when killed) twenty pounds the pair, and in some instances even more than this. As to the consumption of food, we have not found them to require more than the common smaller varieties.

There are some singular traits in the Rouen duck: the eyes are very deeply sunk in the head, giving the ducks, even when young, the appearance of old birds; the abdominal pouch, or enlargement of the lower part of the body, in some specimens, gives them an ungainly appearance. This enlargement of the lower part of the body causes it to rest on the ground — not unfrequently, indeed, to the destruction of the feathers. The whole appearance of the Rouen duck is certainly ungainly, but the most inconsiderate observer can hardly fail of being struck with the size of really good specimens of this family. Their dull, loud, monotonous call, is also distinct from every other variety. A great diminution in size is the inevitable result of any attempt at crossing, and this becomes apparent in the first generation. They are as hardy as any other kind, and rarely evince any disposition to wander from the immediate vicinity of the homestead. They appear to care less for water exercise than the other varieties.

THE AYLESBURY DUCK.

The characteristics of the Aylesbury duck are, plumage of unspotted creamy white, a pale flesh-colored bill, a dark, prominent eye, and orange-colored legs. Their carriage is more upright than that of the Rouen; the eye, of which the iris is dark gray, being also more prominent; and, as might be anticipated from its greater powers of locomotion, the bird is by no means given to such stay-at-home habits. It usually happens, as they advance in age, that their bills are stained with dark spots. It is very common in the second and third year, and in the fourth the bill sometimes becomes perfectly black. So great a disfigurement of one of the principal characteristics of this breed has been a subject of

The Aylesbury Duck.

many enquiries; and from a variety of statements, we are led to believe that where the water which is accessible to the birds flows from a peat or moist soil, the evil, in the generality of cases, probably has its origin; though we are disposed to regard it as hereditary.

The Aylesbury ducks are reputed good layers and assiduous mothers and nurses, especially after the experience of two or three seasons. Their flesh is of a beautiful white, and in the London markets, when fattened, are considered a rarity, and in consequence of their great size command the highest price — one-third more than any other ducks carried to that market.

The Aylesbury ducks are very prolific layers. The eggs vary in color, some being white, while others are of a pale blue. As a further recommendation for them, in an economical point of view, it is argued that their consumption of food is less than that of the common duck; and another advantage may be found in their comparative silence from the everlasting "quack, quack, quack," of the latter bird. They also attain greater weight in less time, and from their superior appearance when plucked, are a far more marketable article.

The manner in which the duck fights the cock is highly amusing and but little known. It frequently happens, while the fowls are being fed, that the duck runs among them, and by his larger beak gobbles up an undue share of the provisions. This the cock resents by giving him a peck. The duck takes no notice, but gets behind the cock, deals him a hard peck, and looks innocent. The cock jumps around, but sees nothing; presently, another hard peck comes, and he is very angry; a third peck, — but this time the cock sees his enemy, and rushes at him furiously. Down flops the duck on the ground, and lets the cock pass over him. After running over him once or twice, and then jumping on him, the cock is persuaded that his enemy is quite dead, and walks off on the tips of his toes. Presently the duck first opens one eye and then the other, gets up and quietly pecks the cock again. The same manoeuvers are repeated, until at last the duck wins, like Fabius, by delay, and drives his antagonist fairly off the field.

THE MUSK OR BRAZILIAN DUCK.

The Musk, or Muscovy duck, as it is commonly called, has, like the East Indian duck, been wrongfully called after the name of a country which certainly never witnessed its existence in a wild state. The appellation "Muscovy," by which term European Russia is often designated, is clearly erroneously applied to this bird, whose plumage is thought to emit the odor of musk, whence the trivial name. They are also alluded to by various writers under the name of Cairo and Guinea duck.

The Musk duck, in a wild state, is only found in South America. It has been observed in the Brazils, and is also a native of Guiana. The narratives of early voyagers to the South American continent, and the numerous groups of islands which stud the Pacific Ocean, afford frequent allusions to these birds, which, however variously named in

such records, have sufficiently clear descriptions of their peculiar appearance and habits to enable us to recognize them without difficulty. Brazil appears to have been one of their principal habitats; hence one of the designations connected with this bird.

The French naturalists assert that this is a distinct species, and not a variety. It is much larger than the common duck, and is distinguished by a caruncled membrane, of a red color, which has been compared to a cherry, covering the cheeks, and extending behind the eyes, swells at the root of the bill. This tubercle is wanting in the female, and also the tuft of narrow and rather twisted feathers, which hangs behind the head of the male, and which stands erect when excited. She is also smaller. Both stand low on the legs, have short claws, and the inner ones crooked; are a clumsy bird on the ground, but light on the wing. Travelers assert that these birds perch on large trees that border the rivers and marshes, similar to terrestrial birds; they build there, and as soon as their ducklings are hatched, the mother takes them one by one, and drops them into the water; laying takes place two or three times a year, and is from twelve to eighteen eggs, quite round, and of a greenish white; the moulting season begins in September, and is sometimes so complete that the ducks, finding themselves almost entirely destitute of feathers, are unable to fly, and let themselves be taken alive, by the Indians. These birds are as shy as our wild ducks, and it is by surprise alone that they are to be shot.

The Musk or Brazilian Duck.

The first point that strikes us, in the Musk duck, is the disproportionate size of the male and female, — the latter not exceeding five, or at the most six pounds, live weight, while the drake frequently reaches nine or ten pounds. They are of various colors, from black to white, with admixture of brown and drab. But the black color would seem to belong to the bird in its wild state, and the best specimens of the tame birds are of similar plumage. The feathers of these are richly bronzed, and white patches generally appear on the wings of the first moult. The colors of thelegs and feet vary with that of the plumage, being mottled in dull flesh color and black, according to the tints of the latter. The duck has considerable powers of flight — can rise in a small enclosure, and fly over a fence seven feet high; but the drake's heavier bulk retards his aerial excursions. They are less aquatic in their habits, though equally disposed to cultivate a familiar intercourse with man. The voice of the drake is so harsh and croaking, that he

has been described as if perpetually suffering from a sore throat; and contrary to the usual rule among their congeners, the famale is comparatively silent.

As layers they are inferior to the Rouen and Aylesbury, but probably on a par with the usual inhabitants of the duck pond. The egg seldom exceeds three ounces in weight, and is of a dull white. The period of incubation is about five weeks.

In their wild state the drakes are strictly monogamous, though admitting the companionship of several consorts in a state of domestication. We find one drake sufficient for four ducks. They are good breeders, the young tough and hardy, and the rearing is not attended with greater difficulty than those of the other domestic varieties.

The young of the Musk duck is equal for the table to any other; and whatever is said against it arises, we think, from prejudice; for we never sit down to dine off a young Musk drake in good condition, without pronouncing it excellent. Old birds are, no doubt, both rank and tough; but such we have never tasted.

Hybrids between the Musk and other tame ducks are common, and the birds thus produced are of large size — seven and eight pounds each being no unusual live weight. It is asserted, on good authority, that such hybrids have proved prolific; we have failed to obtain any certain proof on this point, and much doubt the assertion. The Musk duck, when crossed with any of our other races, gives a large but coarse hybrid, usually sterile, but in some few instances asserted to have been productive with the common duck. The form of such half-breeds is sufficiently indicative of their origin, especially the large, rounded head, coarse legs, and the partial development of crest.

The rearing of the young of the Musk duck is not attended with greater difficulty than those of the other domestic varieties. No very high opinion is entertained as regards the appearance, habits or economy of this bird in the poultry-yard. The bloated look of the head, the inordinate length of the body, and its awkward legs, mar the effect of colors that are often brilliant and striking. They are sad tyrants, too, and of a temper that disposes them to bully their weaker companions; while for the table, the Musk duck, young and in good condition, is equal if not superior to any other. They are great foragers, fatten easily, and the only difference that we have observed is, that they consume more green and vegetable food.

BUENOS AYREAN DUCK.

This variety of duck is of recent introduction into England, and not usually met with in this country, but deserves to be better known. It is called the Buenos Ayres duck, better known in England as the East Indian duck. But whether they are natives of South America, or imported from the Asiatic continent, we know not. Nothing is more probable, however, than that these birds were imported from the East, via. Buenos Ayres. It is described as of less size and lighter frame, than either the Rouen or Aylesbury breed, the full-grown male rarely

exceeding five pounds. Their plumage, however, is said to be strikingly beautiful, and possesses the peculiarity, unusual in this genus, that the drake does not monopolize all its glories, a portion of his refulgence being granted to the duck. Metallic tints, varying with the light from green to a gilded purple, decorate their garb of uniform velvet-black, their bills and feet being of the same dark hue. Withal, their singularly neat and close make, and compactness of feathers, suggest their comparison in these respects with the game fowl.

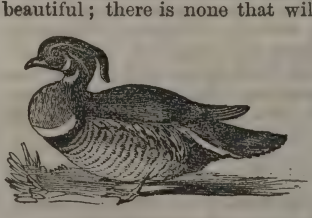
The drakes are unusually pugnacious, and on this account it is impossible to keep any two of them in the same enclosure. Imported birds of this breed usually pair; but those bred in domestication will occasionally attend to three or four ducks.

The first eggs laid by the duck, in the beginning of the season, are frequently smeared with dark greasy matter, which causes them to appear slaty, and sometimes even of a black hue. The coloring matter does not penetrate the shell, but may be scraped off like the similar coating on the bones of the white silk fowl. When six or eight eggs have been deposited, they gradually fade away to a dull white. In form, they are elongated, being smooth, thin-shelled, and weighing about two ounces. The ducklings are somewhat difficult to rear, being very subject to cramp; this will not surprise us, when we remember the warmer temperature of their original Eastern abode.

The Buenos Ayrean ducks are less disposed to confinement than other domestic breeds, and the most suitable locality is found for them on a piece of ornamental water, where, in addition to the beauty of their appearance, they add the further recommendation of the highest gratification for the table. For this purpose they require no fattening, and but few wild ducks are more tender or of higher flavor.

THE WOOD DUCK.

Of all the whole tribe or family of ducks known, this is the most beautiful; there is none that will compare with it for richness, gorgeous plumage, and variety of colors — the Mandarin duck of China being the only one approaching it, which indeed it strongly resembles. It is called "Wood duck," from the circumstance of its making its nest in hollow trees. It is called "Summer duck," from its remaining with us during the summer only: it migrates southwardly on the approach of cold weather. Its favorite haunts are in the solitary, deep, and muddy creeks, ponds and mill-dams of the interior, — making its nest frequently in old hollow trees that overhang the water. In its wild state, its food consists of acorns, seeds of aquatic plants, and insects. It is peculiar to America.



The Wood Duck.

The Wood duck seldom flies in flocks of more than three or four

individuals together, and most commonly in pairs. The common note of the duck is "*peet, peet;*" but when standing sentinel, if he sees danger, he makes a noise not unlike a young pig, "*oe eek! oe eek!*"

This most beautiful duck is easily domesticated, and has often been tamed; it is chiefly valuable as an ornament to pleasure grounds, on account of its brilliant plumage. They soon become nearly as tame and familiar as other ducks. It is generally conceded, we believe, and there seems no possible doubt, that all domestic fowls which we now possess, have been reclaimed from a state of nature. We are pretty certain the turkey, and the Musk or Brazilian duck, have been recently reclaimed; and we see no reason why many more may not be domesticated as well, if any particular pains were taken to do it. About forty years ago, as we are informed, a Mr. NATHAN NICHOLS, who lived on the west side of Gunpowder Creek, had a whole yard swimming with Wood duck, which had been tamed and completely domesticated, so that they bred and were as familiar as any other tame ducks. M. VASSAR, of Springside, has them now (1858) which were bred in his yard. Mr. JOHN GILES, of Woodstock, Conn., also breeds them. They are also tamed in various parts of the Union. LATHAM says that they are often bred in European menageries.

DESCRIPTION. — The Wood duck is from nineteen to twenty inches in length, and twenty-eight in extent; bill red, strongly toothed, much hooked, shorter than the head, the feathers in front descending low, margined with black; head deep glossy green; irises orange-red; front crown and pendant crest rich, glossy, bronze-green, ending in violet, elegantly marked with a line of pure white running from the upper mandible over the eye, and with another band of white proceeding from behind the eye, both mingling their long pendent plumes with the green and violet ones, producing a rich effect; cheeks and sides of the upper neck violet; chin, throat, and collar round the neck, pure white, curving up in the form of a crescent nearly to the posterior part of the eye; breast dark violet-brown, marked on the fore part with minute triangular spots of white, increasing in size until they spread into the white of the belly; each side of the breast is bounded by a large crescent of white, and that again by a broader one of deep black; sides under the wings thickly and beautifully marked with fine undulating parallel lines of black, on a ground of yellowish drab; the flanks are ornamented with broad, alternate, semi-circular bands of black and white; sides of the vent rich, light violet; tail-coverts long, of a hair-like texture at the sides, over which they descend, and of a deep black, glossed with green; back dusky-brown, reflecting green above, below dusky; primaries dusky, silver-hoary without, tipped with violet-blue; secondaries greenish-blue, tipped with white; wing-coverts violet-blue, tipped with black; vent dusky; legs and feet yellowish red; claws strong and hooked.

The female has the head slightly crested, crown dark purple, behind the eye a bar of white; chin and throat, for two inches, also white; head and neck dark drab; breast dusky brown, marked with large

triangular spots of white; back dark bronze-brown, with some gold and greenish reflections. Speculum of the wings nearly the same as in the male, but the fine penciling of the sides, and the long hair-like tail-coverts, are wanting; the tail also is shorter.

THE MANDARIN DUCK.

A remarkably beautiful addition to our water-fowl is the Mandarin duck, contributed by the Celestial Empire. In many respects, it resembles our American Wood duck, which is one of the most beautiful of the family of ducks, but is said to be surpassed by the Mandarin species, which is even more beautiful and gorgeous in its plumage. Of its habits we are not advised. The specimen from which the annexed portrait was taken, has been bred in the Zoological Gardens in the Regent's Park, London, having been originally brought from Whampoa, in China. It is only within a few years that they have been introduced into this country. In 1854, Mr. JOHN GILES, of Woodstock, Connecticut, imported a pair of these beautiful birds, which are said to have cost in England 75 guineas, (about $375.)

The Mandarin Duck.

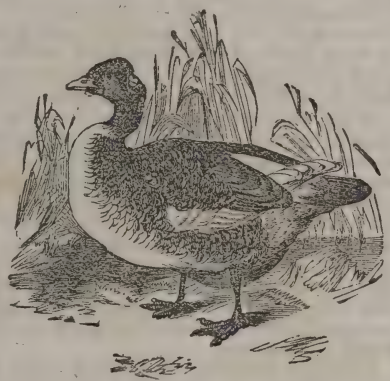
The Mandarin drake is represented as being the most gorgeous in plumage of all water-fowl, (with the exception of our American Wood duck, which it somewhat resembles.) The top of the head is black, a color which extends down the nape of the neck; below is a clear white line, passing over the eye down the base of the bill, which is of a bright, deep, rose-color. The cheeks and the long pointed feathers of the neck are of a bright orange-brown; the flight-feathers are white and black. The tail is black, except underneath, which is white. The sides of the breast are greenish orange, margined with a clear white line. The legs are a deep pink. From the middle of June till the middle of September, the drake assumes the more plain garb of the duck, which is a dull olive-brown. He is very pugnacious, and quite a tyrant over the other aquatic birds.

THE GOOSE.

The domestication of the goose, like that of the domestic fowl, is hidden in the remotest ages of antiquity. Among the Greeks and Romans it seems to have been the only really domesticated water-fowl they possessed, and appears to have held exactly the same place in

their esteem that it still retains with us, after the lapse of two or three thousand years.

It is very natural to inquire whence so remarkable and valuable a bird was originally obtained; but the conclusion generally arrived at appears to be inconsistent, not merely with truth, but even probability: viz., that it results from the crossing and intermixture of several wild species. None of the ancient accounts indicate any such fact; but on the contrary, they declare the domestic goose was in the earliest ages exactly what it is at the present time. According to popular opinion, however, the domestic goose is generally considered as having been derived from the Grey-legged goose; but such a circumstance is rendered highly improbable from the well known fact that the common gander, after attaining a certain age, is invariably white. The Grey-legged goose certainly approaches nearer to the domestic bird than any other; and if we are limited to any one of the wild birds of this genus, now known to us, in our inquiries for the probable ancestor, it is to this species that, in our humble opinion, the honor should be assigned.



The Domestic Goose.

Mr. YARRELL, in his work on British Birds, mentions the following instance, in strong corroboration of this relationship:—"The Zoological Society, possessing a pinioned wild Gray-legged gander, which had never associated with the Bean goose, or the White-fronted goose, though both were kept on the same water with him, a Domestic goose, selected in the London market from the circumstance of her exhibiting in her plumage the marks which belong to and distinguish the true Grey-legged species, was this season (1841) brought and put down to him. The pair were confined together for a few days, became immediately very good friends, and a sitting of eggs was the consequence, and have proved prolific."

SELBY, in his *Illustrations of British Ornithology*, says: "It is generally admitted that our race of domestic geese has originally sprung from the Grey-legged species, and however altered they may now appear in bulk, color, or habits, their essential habits remain the same; no disinclination to breed with each other is evinced between them, and the offspring of wild or domesticated birds are as prolific as their mutual parents."

The common grey, white, or mottled goose, of which our figure, on the preceding page, taken from *Brown's Poultry Yard*, is a good illustration, has hitherto, with but few exceptions, formed the general stock of this country; and from disregard to their degeneracy, by breeding in-and-in, inferior specimens have become by far too common. These causes, too, with neglect of proper attention when young, have in many instances so reduced their weight at maturity, that they fall short of a Brazilian drake; and a corresponding depreciation of the flesh, in both flavor and texture, is the consequent result.

Of all the domestic birds, none are so profitable as geese, where there are facilities for keeping them; for there are none which can do so much for themselves when alive, and none that come to so little waste when dead. Unlike the fowl, all parts of the goose are equally good. Besides which, every feather is of value, greater than that of every other of our domestic birds. Every housewife knows how to appreciate beds made of their feathers; and in these days of steel pens, the goose still possesses quills. When young, the goose is a popular dish on the table, and most esteemed by the epicure. How is it, then, that the goose is not more popular with the farmers? It can only be accounted for by the fact — for fact it is — that it is not in every one's power to keep them.

The chief requisites for keeping geese, are a pond of water and a pasture for grazing. The latter is essential, as the bird is graminiverous as well as graniverous. An occasional cabbage-leaf will form an acceptable variety of food, and during the winter any spare vegetables will help to supply the deficiency of the pasture. If fed high, some varieties of geese will often lay in autumn, but the advantage of a brood of goslings in November is questionable.

In allowing geese to range at large, it is requisite to be aware that they are very destructive to all garden and farm crops, as well as to young trees, and must, therefore, be carefully excluded from orchards and cultivated fields. It is usual to prevent them getting through the gaps or holes in fences, by hanging a stick or yoke across their breasts.

They are accused by some of poisoning the grass, and of rendering the spots where they feed offensive to other grazing stock; but the secret of this is very simple. A horse bites closer than an ox, a sheep goes nearer to the ground than a horse; but after the sharpest shearing by sheep, the goose will polish up the turf, and grow fat upon the remnants of others. Consequently, where geese are kept in great numbers on a small area, little will be left to maintain any other grass-eating creature. But if the commons are not short, it will not be found that other grazing animals object to feeding either together with, or immediately after a flock of geese.

It has already been said that geese are much given to grazing, but we have not said that they improve the pasture. This, however, is the case, although there is an old proverb to the effect that nothing *will* eat after a goose, — whereas the auxiliary verb should be *can*, and not *will*.

The fact is, the goose will thrive on pasture so short that a goat would starve on it; and the consequence is a short, sweet herbage.

Although water is the natural element of geese, yet it is a curious fact that they feed much faster in situations remote from rivers or ponds. They should not be allowed to run at large when they are fattening, as they do not acquire flesh nearly so fast when allowed to take much exercise. It is stated that geese can be raised, in a proper situation, at a profit far greater than almost any other stock. But to do this, more attention is required than is usually bestowed on their keeping and management. Like other fowls, they may be brought by proper management to a great degree of fatness; but the period at which they are the fattest must be chosen to kill them, otherwise they will rapidly become lean again, and many of them would die.

Geese may be fattened at two different periods of their lives — in the young state, when they are termed "green geese," and when they have attained their full growth. The methods at each period are very nearly the same. A goose diet, for the first two weeks, is formed of oats and water mixed in a trough; after this, the food is gradually changed to barley meal mixed with water, of the same crumbling consistence that has been recommended for the goslings, the water being given separately in small quantities. Steamed potatoes, mashed up with four quarts of buckwheat or oats, ground, to the bushel, and given warm, is an excellent diet, and will render geese, cooped in a dark place, fat enough in three weeks.

VARIETIES OF THE GOOSE.

"In the species of the *Goose*," says BOSWELL, "*properly so called*, nature knows but one race. The industry of man has created another, larger, whose shape, color, as well as nature, have undergone those modifications which are to be observed in all animals that have for a long time been domesticated." DICKSON says there is only one sort of the common goose. The wild goose is of a brownish-ash color, the individual feathers being lighter on the edge; the belly is snow-white. The tame varieties are of various colors, chiefly white, and all the various shades of gray.

We can enumerate ten varieties of the goose, six of which are now in our possession at Springside: viz., the Common Goose, the Bremen Goose, the African Goose, the White Chinese Goose, the Brown Chinese Goose, the Toulouse Goose, the Egyptian Goose, the American Wild Goose, the Bernicle Goose, and the Brent Goose. The common goose of the country is so well known that a description is deemed unnecessary. We will therefore commence with

THE AMERICAN WILD GOOSE.

This bird, by all foreign writers, is called the Canada Goose. Most writers on poultry call it a variety of the common goose; but it is no more a *variety* of goose, than the Swan, which it greatly resembles. CUVIER seems to doubt whether it is a goose at all, and says that it cannot properly be separated from the true swans. DICKSON says it is

a variety, and not a distinct species, which, from our own experience, we are led to doubt. We once possessed a Wild gander that had been pinioned by a shot in the wing, which mated with a common domestic goose, and we bred from them for more than ten years; but their produce were not fruitful, although they laid eggs. The hybrids never showed any disposition to pair or mate with either the wild or domestic goose. They partake largely of the wild habits, and if their wings are not clipped spring and fall, (and more particularly in the spring,) they are very apt to fly away and not return.

The American Wild Goose.

The American Wild Goose, (of which our figure, taken from *Browne's Poultry-Yard*, is a good representation,) is not uncommon in a state of domestication; and in spite of its migratory habits, which it appears in almost every case to forget in a reclaimed or domesticated state, shows much more disposition to true domestication than the Swan, and may be maintained in perfect health with very limited opportunities for bathing. It is abundant as a wild bird, breeding in the Arctic regions and speeding south on the approach of winter; and its migrations north are the sure signs of returning spring. It is now to be classed among our domestic water-fowl, and is kept as an ornament to our ponds and sheets of ornamental water.

Wilson says: "I never visited any quarter of the country where the inhabitants are not familiarly acquainted with the passing and repassing of the wild goose. The general opinion *here* is, that they are on their way to the lakes to breed; but the inhabitants on the confines of the great lakes are equally ignorant with ourselves of the particular breeding-places of these birds. *There*, their journey north is but commencing, and how far it extends it is impossible for us at present to ascertain." They were seen by Dr. Kane in flocks, within the Arctic circle, and were then pursuing their way still farther north, probably to Symmes' Hole. They have also been seen on the dreary coast of Spitsbergen, feeding on the water's edge. It is highly probable that they extend their migrations under the very pole itself, amid the silent desolation of unknown countries, shut out from the eye of man by everlasting barriers of ice. That such places abound with suitable food, we cannot for a moment doubt.

In a state of nature, the American Wild Goose eats worms and soft

insects, as well as grass and aquatic plants,—which the typical, or goose proper, never does. In a domestic or confined state they do not breed till they are at least two years old, and so far approach the Swan,—like which, also, the male appears to be fit for reproduction earlier than the female. But AUDUBON says: "That this tardiness is not the case in the wild state, I feel pretty confident; for I have observed having broods of their own, many individuals, which, by their size, the dullness of their plumage, and such other marks as are known to the practical ornithologist, I judged not to be more than fifteen months old."

THE BREMEN GOOSE.

This valuable variety of geese was first introduced into this country in 1821, by Col. SAMUEL JAQUES, of Ten Hills Farm, near Boston. We were always under the impression that Mr. JAMES SISSON, of Warren, Rhode Island, was the first importer of these superior geese, but it appears incorrect from the following account, published in the *New England Farmer:* "In the fall of 1826," says Mr. SISSON, "I imported from Bremen (north of Germany) three full-blooded perfectly white geese," &c. They are originally from Holland, and the appellation of "Bremen" has been obtained from the port of that name. Beyond their great size, and the uniform clear white of their plumage, we are at a loss for any sign of a specific difference between these and the common goose. In figure they are alike, and the bill and legs are of the same brick-dust hue; the permanency of these advantages, however, (above alluded to,) may justify our speaking of them as a sub-variety.

The Bremen Goose.

We claim pre-eminence for the Bremen geese. One of their great advantages is this,—that all the feathers being perfectly white, their value, where many are kept, is far greater in the market than is ever the case with mixed feathers. In weight, too, these birds have an advantage over every other,—even the Toulouse, of which we shall speak hereafter. All white poultry, again, are considered to dress—that is, to pluck, of a clearer and better appearance than colored birds.

As quality of flesh, combined with weight, is a main consideration, the flesh of the Bremen is essentially different from that of any other of our best varieties of domestic geese. It does not partake of that dry character which belongs to other and more common kinds, but is tender and juicy. Some of the greatest epicures have declared that the flesh of the Bremen goose is equal to that of the famous Canvass-back duck. There is assuredly some comfort, not uncombined with ease, in carving a bird that weighs seventeen pounds, and taking a

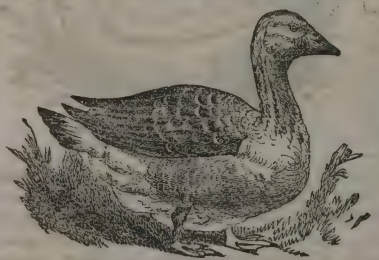
slice from the breast, so long as to be obliged to cut it into two, that one-half may cover no more than the width of a common dinner plate.

The quiet, domestic character of the Bremen geese causes them to lay on flesh rapidly; they never stray from their home, the nearest pond and field satisfying their wants, and much of their time is spent in a state of quiet repose. Their characteristice are peculiar. They commence laying at an earlier period than this northern latitude favors, which is in the latter part of February or first of March. They frequently rear two broods in a season, the young ones proving as hardy as any other.

DESCRIPTION. — The Bremen goose has prominent blue eyes, is remarkably strong in the neck, and the feathers, from near the shoulder to the head, are far more curled than is generally seen in other birds. Plumage pure white. The bill, legs, and feet, of a beautiful yellow. Like, with them, always produces like.

THE TOULOUSE GOOSE,

As its name indicates, originated in France, and is distinguished from the dark gray variety of the common goose — which it greatly resembles — not only by its greater size, but also by its colors being darker and more intense; by the bright orange hue of the bill, legs, and the orbit around the eye, as also by the singular development of the abdominal pouch. The orbit itself is also much larger, and the head more depressed. The last characteristic, the usual proportions of the abdominal pouch, is abundantly displayed in the same excess as is sometimes seen in the dew-laps of cattle; and this occurs in a short period after they have emerged from the shell. The goslings will begin to assume this ordinary feature of mature birds when not ten days old, and in ten months it will be seen almost touching the ground.



The Toulouse Goose.

Some of the earliest birds of this breed were imported into England, by the Earl of Derby, from the south of France — probably from Marseilles. We are not aware of any of this variety of goose having been imported into this country. Like the Bremen variety, they are said to attain great size, and by the continuous retention of certain fixed colors in their plumage, with some other peculiarities, they would seem to be equally entitled to the separate position of a "sub-variety." DIXON says: "The Toulouse geese, which have been so much extolled and sold at such high prices, are only the common domestic, enlarged

by early hatching, very liberal feeding during youth, and perhaps *by age.*"

The weight attained by the Toulouse goose is said to be enormous, and in a good locality, and under good management, must insure an admirable return for food consumed and the other expenses of their keep. To these merits we may add another recommendation, in the fact that "even when fed to the greatest weights, they never become disgustingly fat, as too often happens with the common goose."

DESCRIPTION. — Head depressed, and of a more elongated form than in the common goose; bill three inches in length, by two inches in depth at the base, in color a clear orange-vermillion, the nail at its extremity being white; irides dark brown; orbit large, and of the same color as the bill. The plumage of head and neck ash-gray, the latter showing "the curl" in a very marked manner. Throat a light tint of gray; breast, back and thighs dark grayish brown, with a margin of white, more or less distinct, on each feather. Greater wing-coverts brown; lesser wing-coverts a light gray. Primary wing-feathers, of which the second is the longest, ash-gray, becoming very dark rich brown at their extremities, the shaft being a clear white; secondaries and tertials dark leaden brown; scapulars the same, with a narrow light edge. Under part of the body white; tail-coverts white; tail-feathers brown, with broad white band at the extremity. Legs and feet, reddish yellow; claws dusky. The wings, when folded, about half an inch shorter than the tail."

THE HONG KONG GOOSE.

This goose has as many names as the Spanish Don, who knocked at a cottage door to ask for a night's lodging. "Who's there?—What do you want?" said the inmates. "Don Juan Josi Pedro Antonio Carlos Jeronimo, etc., etc., wants to sleep here to-night." "Get along with you," was the reply; "How should we find room here for so many fellows?" The Hong Kong goose is in the same position as the Spanish Don. It has names enough to fill a menagerie — China goose, Hong Kong goose, Knob goose, Swan goose, Asiatic goose, African goose, Guinea goose, Spanish goose, Poland goose, Muscovy goose, and the Lord only knows how many more.

The Hong Kong Goose.

The old writers called it the "Guinea goose," for the excellent reason, as WILLOUGHBY hints, that in his time it was the fashion to apply the epithet "Guinea" to everything of foreign, uncertain origin. Spanish goose is another title, probably as appropriate as Guinea goose. BEWICK has given an admirable wood-cut of this bird, and has evidently selected the male, which is larger, taller, and more erect than

the female, though to both may be applied WILLOUGHBY'S description: "A stately bird, walking with its head and neck decently erected." BEWICK calls it the Swan goose. The tubercle at the base of the bill, the unusual length of neck, and its graceful carriage in the water, give it some claim to relationship with the real Swan. CUVIER goes further, and says "that this and the Canada [American Wild] goose cannot be separated from the true Swans." A goose it decidedly is, as is clear from its terrestial habits, its powerful bill, its thorny tongue, and its diet of grass. And therefore we shall call it the Hong Kong goose,—concluding that CUVIER is right about its home, and other authors about its goosehood.

There is something in the aspect of this bird—the dark brown stripe down its neck, its small bright eye, its harsh voice, its ceremonious strut, and its affectation of never being in a hurry, which seems to say that it came from China. It would perfectly harmonize in a picture of Chinese still life; or it would group well on a broad river, beside a boat filled with shaven fishermen, with their trained cormorants and pig-tailed children. If it does come from China, it has no doubt been domesticated for many hundred years, perhaps as long as the domestic fowl.

This is said to be the largest of the goose tribe; it is nearly of the size of the swan, and often weighs more than twenty-five pounds. They are noble-looking birds, quite ornamental about the premises, and add much to rural scenery—particularly if a sheet of water be near. When floating on its surface they have a stately, majestic appearance, and in their dignified movements they certainly much resemble the swan.

DESCRIPTION.—The head and top of the neck are brown, deeper on the upper side than on the under. Front, sides and base of the neck tinged with fawn color; on the origin of the bill there arises a round and fleshy knob or tubercle; under the throat there hangs a pouch, or sort of fleshy membrane or dewlap, which is neither soft nor flexible, but firm and hard. Wings darker than the body; under parts of the body white; feet, legs and bill, nearly black.

THE CHINESE GOOSE.

Of this family there are two varieties, the Brown and the White. The prevailing color of the plumage of the first, is a light yellowish brown, relieved by markings of deeper tints of the same color. The different shades are very harmoniously blended, and are well relieved by the black, tuberculed bill, and the pure white of the abdomen, and the dark streak running down on the back of the neck. Slight variations occur in the color of the feet and legs, some having them of a dull orange, others black: a minute and delicate fringe of white feathers is occasionally seen at the base of the bill. These peculiarities are hereditarily transmitted. The characteristic features of this bird—the black tuberculed bill, and the dark brown stripe that passes down the neck—are not uncommon. The brown, red-legged, black-

knobbed, are identical in form and characteristics, and bear close affinity to the Hong Kong geese.

The male is almost as much disproportionally larger than the female as the Musk drake is in comparison with his mate. He is much inclined to libertine wanderings, without, however, neglecting to pay proper attention at home. If there is any other gander on the premises, they are sure to disagree; one of the two had better be got rid of. Both male and female are, perhaps, the most boisterous and noisy of all geese; at night, the least footfall or motion in their vicinity is sufficient to sound the alarm and call forth their clanging and resonant trumpetings. This, to a lone country-house, is an advantage and a protection. Any fowl-stealer would be stunned with their din before he captured them alive, and the family must be deaf indeed that could sleep on this alarm thus given. But by day it becomes a nuisance to the majority of hearers, and has caused them to be relinquished by many amateurs.

The Chinese Goose.

Although a native of a warm climate, this bird appears very well naturalized in this country; the only, or the greatest objection to them is their early laying, which often occurs in the dead of winter. It will couple and breed with the common goose, but there would be no improvement on either side by the cross. It is smaller in size than the common goose, and what they lack in size they make up in prolificness. "They are valued in this country," (England,) says MAIN, "as they are in their own, for their early breeding and aptitude to fatten. They begin laying at the end of November, if the season be mild, and in January goslings are hatched, and if kept in a dry, warm room, may be fit for the table in April or May. They are, however, excessively noisy birds; their flesh less bright, and considerably less delicate, than our common goose; they are also much smaller."

THE WHITE CHINESE GOOSE,

With its snow-white plumage, yellow bill, and orange-colored legs, is infinitely a more attractive bird than its dusky relations, and would

form a beautiful ornament on a piece of water. Its size is smaller than the brown, very erect in its carriage, and merits the term "swan-like" more than any other member of the species. It has been sometimes called swan-goose. In its shape and motions in the water, it certainly much resembles the swan. It also resembles the swan in other respects. She glides through or rather over the water, with her neck beautifully arched, her head drawn in, her breast just settled in the water, her tail a little raised, giving a light, airy appearance, moving on the water with apparently little or no exertion, and we may say in the language of the poet, "in all her actions dignity and grace." It is delightful to see them, on a fine day in spring, lashing the water, diving, skimming the surface, rolling over through mere sport, and playing all sorts of antics.

The eggs of the Chinese goose are somewhat less in size than those of the common domestic kind, of a short oval, with a smooth, thick shell, white, but slightly tinged with yellow at the small end. The goslings, when first hatched, are usually very strong. If there is anything like good pasture for them, they require no further attention than what their parents will afford them. If well fed, they come to maturity very rapidly. In between three and four months from the time of their leaving the shell, they will be full grown and ready for the spit. Their flesh is well-flavored, short and tender. Hybrids between them and the common goose are prolific; the second and third cross is much prized by some, particularly for the ganders, and in many flocks the blood of the Chinese cross may be traced, often by the more erect gait of these birds.

THE BERNICLE GOOSE.

The Bernicle is the smallest of the goose tribe, and inhabits the northern parts of Europe and America, but during the winter resorts to the shores of Great Britain in great numbers. In its wild state, it is an extremely shy bird; and cannot be approached without the greatest caution and skill. In domestication, they are kept more for ornament than use, and are valued as embellishments to our pleasure-grounds and ponds. Their small size renders them suitable even for a very limited pleasure-ground, and they are perhaps the very prettiest geese that have yet appeared in our poultry-yards; they are easily domesticated, and associate with other geese, as their habits are similar. The old birds are very gentle in their disposition, and are less noisy than most other geese.

The size of a Bernicle goose is about that of a Musk duck, but the goose stands higher on the leg. The female differs little from the male, being distinguished by voice and deportment more than by plumage. Their short bill, moderate sized webs to their feet, and rounded proportions, are said to indicate an affinity to the Cricupsis.

Color.—Forehead and cheeks white, the rest of the head and neck black; body ashy gray, barred with white; legs and bill black; eyes black; bill short and stumpy.

Of the origin of this goose the most absurd tales have been told. All agreed that it was produced from a tree; but the latest and most approved account was that of GERARD, who in 1636 wrote as follows: "But what our eyes have seen, and hands have touched, we shall declare. There is a small island in Lancashire, called the Pile of Foulders, wherein are found the broken pieces of old and bruised ships, some whereof have been cast thither by ship-wrake, and also the trunks and bodies with the branches of old and rotten trees, cast up there likewise; wherein is found a certaine sprume or froth, that in time breedeth into certaine shels, in shape like those of muskle, but sharper pointed, and of a whitish color; one end whereof is fastened into the inside of the shell, even as the fish of oisters and muskles, the other end is made fast unto the belly of a rude mass or lumpe, which in time cometh to the shape and form of a bird: when it is perfectly formed the shell gapeth open, and the first thing that appeareth is the foresaid lace or string; next come the legs of the bird hanging out, and as it groweth greater it openeth the shell by degrees, til at length it is all come forth and hangeth only by the bill: in short space after it cometh to full maturitie, and falleth into the sea, where it gathereth feathers, and groweth to a fowle."

The Bernicle Goose.

HABITATION.

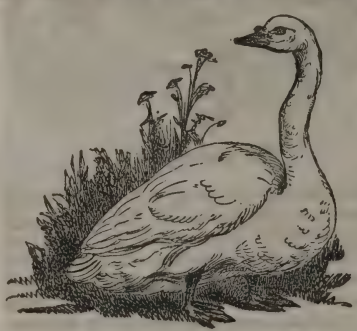
In selecting a situation for a goose-house, all damp must be avoided; for geese, however much they may like to swim in water, are fond at all times of a clean dry place to sleep in. It is not good to keep geese with other poultry; for when confined in the poultry-yard they become very quarrelsome, and harrass and injure the other fowls: therefore it is best to erect low sheds, with nests partitioned off, of suitable size to accommodate them; and there should never be over eight under one roof; the larger ones generally beat the smaller, in which case they should of course be separated, one from the other, by partitions extending out some distance from the nests. The nests for hatching should be made of fine straw, of a circular shape, and so arranged that the eggs cannot fall out when the goose turns them. From fifteen to seventeen eggs will be as many as a large goose can conveniently cover.

In the evedt of any one being induced by our account to keep geese, let us recommend him not to begin with young birds. They are not

to be depended upon for breeding until the third year, and do not attain their perfection for a year or two subsequent to that age. When once in their prime they never retrogade, so that, barring accidents, a person possessed of a gander and three or four geese (no way related to each other, and in their prime of days,) may consider himself set up in the *anserine* for life.

THE SWAN.

Like the Peacock on the land, the Swan is the most noble and elegant fowl on the water. Though they are seldom found on any farms in this country; and are not in request as food, they are well worth the notice of any one having a pond or an enclosed part of a creek, to enliven and beautify the scenery by a small family of swans.



The Swan.

In Europe, swans are kept in parks and pleasure grounds, as appropriate ornaments of their ponds and streams, being among birds, when floating in their native element, unrivalled in beauty and majesty of appearance. When on land, the swan can hardly be supposed to be the same bird for its motions are awkward, and its neck stretched forward with an air of stupidity, seeming only a larger sort of goose; but when gliding along the water, it displays a thousand graceful attitudes, and moving at pleasure with but the slightest apparent effort, there is not a more beautiful figure in all nature. In its form, we find no broken or harsh lines; in its motions, nothing constrained or abrupt, but the roundest contours and the easiest transitions; the eye wanders over the whole with unalloyed pleasure, and with every change of position, every part assumes a new grace. It will swim faster than a man can walk!

Swans were formerly held in such great esteem in England, that by an act of Edward the Fourth, none, except the son of a king, was permitted to keep a swan, unless possessed of a freehold to the value of five marks a year. At present, they are not valued for the delicacy of their flesh, but numbers are still preserved for their beauty. Many may be seen on the Thames, where they are esteemed royal property, and it is accounted felony to steal their eggs. The swan is a long-lived bird, and sometimes attains the age of more than a hundred years.

The color of the plumage of the tame swan is entirely white; the bill and feet are black; the female has a small yellow stripe on each

side of the cheek. Under the feathers is a very thick, soft down, which is made an article of commerce for both use and ornament. They generally weigh full twenty pounds.

The chief food of the swan is corn, bread, herbs growing in the water, and roots and seeds which are found near the margin. At the time of incubation it prepares a nest in some retired part of the bank, and chiefly where there is an islet in the stream. It is six weeks before the young are incubaied,—which are ash-colored before they leave the shell, and for some time after. It is not a little dangerous to approach the old ones, when their little family are feeding around them. Their fears as well as their pride seem to take the alarm, and when in danger, the old birds carry off the young on their backs.

INSECTIVEROUS BIRDS.

BY WM. HOWE, NORTH ALMOND, ALLEGANY COUNTY, N. Y.

In the *Rural Annual* for 1858, I notice an article on Birds, written by C. N. Bement, which, as a whole, is correct, and pleased me much; but there are a few errors in the article, which should be corrected.

In speaking of the "Spotted Woodpecker," he says:—"In looking at a fruit tree, for instance, we may frequently see a series of small holes, like those made by a small gimlet, completely and regularly encircling the trunk, and which are made by this species." This is a mistake. The holes are not made by the Spotted Woodpecker, but by the Downy Woodpecker, an entirely different bird. He never makes them in any but young and thrifty fruit trees, and in the birch and sugar maple. He has two objects in view, viz., sucking the sap which exudes from the incisions, and catching the insects attracted there by the sap. I have watched him and seen him sit for hours by the holes, occasionally sipping the sap, or catching a fly. Because of this habit of sitting as if asleep, country boys call him the "Sleepy Woodpecker." He is a migratory bird, leaving this latitude in September or early in October, and returning in April,—whereas the Spotted Woodpecker is here at all times.

Again, Mr. B. says, "it is an erroneous opinion that these birds injure the trees," etc., by making the holes, when the fact is, that many valuable young apple and pear trees are killed by this girdling.

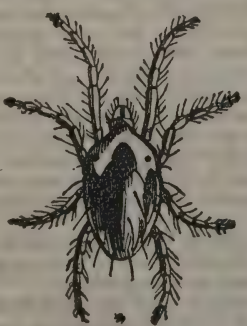
Another error, which many have fallen into, is, that the King-Bird is injurious to bees. Mr. B., in speaking of the good qualities of the King-Bird, says: "By this he more than compensates for the few domestic bees with which he varies his repast," etc., etc. Now I have kedt bees for many years, and have closely watched the King-Bird, with special regard to his alleged habit of catching bees. I never saw him about my hives until the *drones* commence flying—say about the

first of June, and never after the drones are killed off — say about the first of September, and at no time of day except while the drones are flying — say from 11 o'clock A. M. until 2 o'clock P. M. During that time he may be seen watching the bees, and when a drone comes within his range, he darts upon him, and makes short work of him. I am satisfied that he never catches a working bee, except by mistake, which rarely occurs. And now the only question is, whether it is injurious to the swarm to have a few drones prematurely killed. I think it is not. A pair of King-Birds have nested and reared their young, for several years in succession, in a pear tree within three rods of my front door, and have become partially domesticated. I can climb into the tree-top, and nearly lay my hand upon the female, before she will leave her nest; but with a stranger she is not so familiar. Not a hawk or crow can come in sight, but he must leave forthwith; and I lose none of my chickens by their depredations, as long as the King-Birds remain.

Farmers have facilities for observing the habits of birds and insects, which would be great helps to ornithologists and entomologists, if they would improve them. And what is the reason that they do not?

RED SPIDER IN GREEN HOUSES.

The red spider (*acarus tillarius*) is one of the gardener's greatest pests, though so small as to be scarcely visible to the naked eye.



Color sometimes yellowish, at others brown, but often a dull red; on each side of its back is a blackish spot. We annex a cut of one of the natural size, (which our engraver has made somewhat too large,) and one as seen through a powerful microscope. The following method of destroying them will prove efficacious in a mixed collection of green house plants: — Take half a peck of quick lime in lumps, dip the lime into water until it is pretty well soaked, then place it in a tub and put upon the lime one pound of sulphur. Allow it to stand in the green house until it has done steaming; keep the house shut up close while steaming. Then add three gallons of soap-suds, or water with soft soap in it; let it stand until quite clear. Then to half a gallon of the clear liquid add one gallon of clean water, and syringe the plants all over, and especially under their leaves. Repeat this two or three evenings. Repeated syringing will keep them away.

CULTURE OF FRUIT TREES IN POTS UNDER GLASS.

SEVEN years ago, THOMAS RIVERS, of Sawbridgeworth, England, published a little work entitled "*The Orchard House*," in which he described a method of cultivating fruit trees in pots under glass, which he had practiced for some years with great success. The book met with a rapid sale, and has gone through five editions. Hundreds of houses have been built on this plan in England, and give very general satisfaction. We think a brief description of them, condensed from the last edition, published in 1858, will be acceptable to many readers of the *Rural Annual*.

"It was, I think," says Mr. RIVERS, "in the year 1849, that, being very fond of figs, I attempted to grow them in pots in one of my vineries; but finding they required more room than I could spare, I sought for some method by which I could overcome the difficulty. The pots I used, I ought to state, were not placed on benches, but on raised borders, for I had adopted the sunken paths and raised borders for many years, to avoid the expense of the usual benches of wood. The roots made their way through the aperture at the bottom of the pots, and the plants thus, even in comparatively small pots, obtained enough of vigor to support a crop of fruit. After the crop was gathered, the pots were gently turned up on one side, and the roots cut off with a knife, water was withheld, and the plants were soon at rest with well ripened shoots. The following spring they were top-dressed with manure, and again placed on the border; but an idea occurred to me to give more room for the emission of roots by enlarging the aperture at the bottom of the pots: this I at once put in practice, with the most favorable results. I then reasoned, if figs in pots can be made to bear a crop of fruit by thus giving them extra nourishment during the summer, why should not peaches, nectarines, apricots, vines, plums, cherries, and pears, be managed in the same way? They can be; and I have now much pleasure in giving the simple method by which all these choice fruits can be grown on dwarf bushes in pots, with a certainty of a crop every season. I hope to see the day when hundreds and thousands of our small gardens will be furnished with cheap fruit-tree houses."

There are two descriptions of houses adapted to this mode of culture — the lean-to and the span-roofed. The former is the most simple and most common form. We quote Mr. R.'s description:

"I will suppose that an orchard house thirty feet long is required. A ground plan, thirty feet long and twelve feet six inches wide, should be marked out: then six posts of oak or good yellow deal, five inches by three and nine feet six inches in length, or of larch poles sixteen inches in girth cut in two and the flat sides placed outwards, must be firmly fixed two feet in the ground: the ground ends before fixing should be charred two feet six inches from the bottom, and then have a coat of boiling coal tar, which adds much to their durability. They will form the back line of posts, standing seven feet six inches in height from the surface of the ground. For the front wall six posts of the same thickness, four feet six inches long, must be firmly fixed eighteen inches in the ground, so that they stand three feet out. These respective heights of front and back are a matter of choice: they may be exceeded; for I find that trees in pots make most vigorous growth. Two posts will be required at each end; at one end (if only one door is wanted) these will form the door-posts. On these posts, both at front and back, must be nailed a plate, four inches by three, on which the rafters are to rest; the posts are thus arranged in two lines. Now then for the rafters: these must be fourteen feet long. A nine-inch deal — i. e. a deal nine inches wide and three inches thick — will make four, each four and a half inches by one and a half, or nearly so. Instead of "ploughing" the rebate for the glass, which is great labor and waste of material, on the upper side of each rafter, exactly in the centre, must be nailed a slip of half inch board, half an inch wide; this will leave half an inch of the rafter on each side for the glass to rest on — not too much for glass twenty inches in width. The rafters are so far prepared for glazing, but not yet fitted on the plates at top and bottom of the projected house: no mortices must be made, but the rafter fitted to the back plate by cutting out a piece as in fig. 1, and to the front plate as in fig. 2.

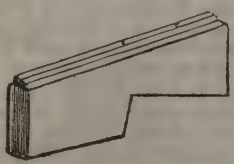


Fig. 1.—Top end of Rafter.

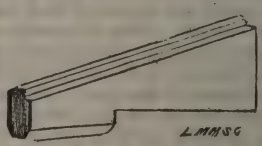


Fig. 2.—Bottom end of Rafter.

They must then be strongly nailed to the front and back plates, leaving a space between each rebate of twenty inches. A piece of three-quarter-inch deal board, six inches wide, should be nailed along the top to the end of each rafter, so as to be even with their upper edges, and in this should be a groove to receive the upper ends of the pieces of glass. At the bottom, a piece of board, one inch thick and six inches wide, must be let in, by sawing a piece out of each rafter, for the glass to rest on, and to carry off the water. We have thus formed a sloping roof

seven feet nine inches (with the plate) high at back, and three feet three inches high in front. The glazing is now to be thought of. The most economical glass is sixteen-ounce British sheet-glass, which can be bought at 2½d. and 3d [5 to 6 cts] per foot, and the size to be preferred, twenty inches by twelve, placing it crosswise, as the rafters are twenty inches asunder. The laps should not exceed a quarter of an inch, and they need not be puttied, as the ventilation is more free when they are not. I find that scarcely any breakage takes place from frost, owing to the large pieces being elastic. On and outside the back posts three-quarter-inch well-seasoned deal boards should be nailed. In the back wall thus formed, sliding shutters in grooves, three feet by one foot, must be fixed, to act as ventilators — two close to the roof and two about three feet from the surface of the ground, as in the annexed sketch; if two more be added to the right and left of the lower shutters, all the better: *in summer it is impossible to give too much air.*

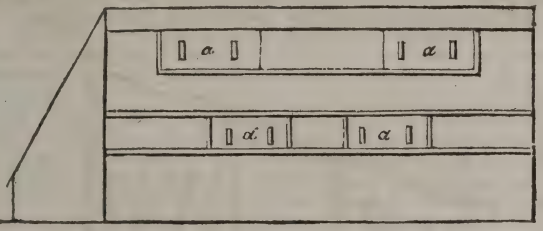


FIG. 3.—Back of Orchard-House. *a*, *a*, *a*, *a*, Sliding Shutters in Grooves.

The front and ends (except the doorway) must have also three-quarter-inch boards, nailed on outside the posts; one of them, the upper one in the front, to be on hinges, so as to let down the whole length of the house: these, with the back shutters, when all open in hot weather, will ventilate thoroughly. To add to this, and it is all required in summer, the boards will shrink and let in air: a fierce sunlight is thus admitted by the large glass, and abundance of air, in which all fruit trees thrive to admiration. The boards and rafters should be painted with stone-colored paint, which will give the house a very neat appearance.

So much for the timber and glass; but when one sees that to walk along the centre of the building, which is about four feet nine inches in height, a person must be of very diminutive stature, the inquiry arises, how is head-room to be made? Simply by making a trench two feet six inches wide, fifteen or eighteen inches deep, in the centre of the ground plan: this will leave a border on each side four feet nine inches wide, and form a path at the same time. The front border need not be raised, as the trees in two or three years will require all the

head-room they can have, but the back border should be raised about eighteen inches above the surface, supported by the brick or boarded edge to the path, for the sides of the path must be supported with boards or four-inch brickwork. It will be found a great improvement to divide the back border into two terraces, by raising the back half twelve or fourteen inches, building a four-inch brick wall, and filling in with earth, so that the back row of trees is elevated, and thus escapes any shade given by the front row; the effect also is very good. Now, as everything depends on these borders — for there must be no benches and no shelves — care must be taken to make their surface loose and open: loose materials, such as lime-rubbish from old walls, and road-sand, mixed with manure, may be laid on them about four inches deep; they may then be forked over to about nine inches in depth, well mixing the above materials with the soil: you have thus two borders not too far from the glass, and *on* which your orchard will thrive admirably. It will appear odd to read about trees thriving *on* instead of *in* a border; but when I explain that this to be an orchard in pots, it will not seem so contrary to our usual garden culture.

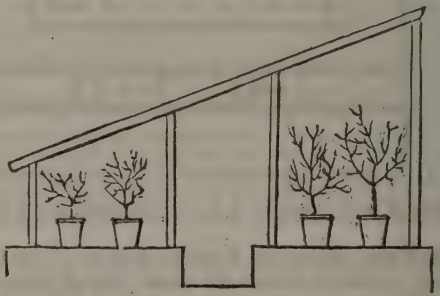


Fig. 4.—Section of the Lean-to Orchard-House.

Size of Pots. — In potting trees for this description of culture, pots of different sizes may be used, according to the taste of the cultivator. If large trees for large houses are required, 15-inch pots (15 inches in diameter and 15 inches deep) will be necessary; for moderate-sized trees, 13-inch pots: this on the whole is the most eligible size. For smaller, compact bushes, 11-inch pots are convenient, as they are not unwieldy, and the trees may be made ornaments of the side-board in the dining-room; and beautiful objects they are when full of fruit. Miniature, yet fruitful, peach and nectarine trees may be grown in very small pots, for I have some not more than nine inches high, in 8-inch pots, full of blossom-buds. Trees of this size must not be allowed to bear more than four or five fruit. They are most interesting, and I have no doubt will, ere long, be extensively cultivated by the curious.

These very small fruitful trees are grafted, which seems to make them precociously fruitful: peaches and nectarines are generally budded.

In remote places, where large pots are difficult to be procured, tubs like those used for orange trees, or more properly boxes, may be employed with success; and for trees of large size, i. e. when they are from ten to fifteen years old, they will probably be absolutely necessary. They are easily made: boards, one inch thick, either of oak or deal, should be firmly nailed together so as to form a box fifteen inches deep and twenty to twenty-four inches square; the bottom should be formed with bars one inch thick, placed about half an inch asunder, to allow the roots to penetrate into the borders.

Apricots. — The best trees for pot culture are those that have been in pots one or two years: if these can be purchased, so much the better. The next best are trees that have been removed and cut down one year in the nursery. If neither of the above can be found, "dwarf maiden trees"* will do. Trees taken from the open ground must not be potted till the end of October. Presuming that potted trees have been procured, they may, early in October, — if omitted then, in November or December, — be repotted into pots of the size selected for this system. I have named 11-inch pots, because they are portable, and the trees may then be shifted into large pots as they advance in growth; 11-inch pots will, at any rate, do well to commence with. October, November, and December, are the best months for potting trees; they may indeed be potted till March, but then no fruit must be expected the first season. If fruit-bearing trees that have been grown in pots can be procured, they cannot be potted too early in October.

I know of no compost better for stone-fruits than two thirds turfy loam and one third decomposed manure, to which some road or pit sand may be added. The loam should not be sifted; if it contains a large proportion of lumps as big as an egg, so much the better. If you examine an 11-inch pot, you will find it eight inches across at the bottom, and the aperture from one inch to one and a half in diameter. Take a light hammer, and enlarge this aperture to five inches in diameter; then place four or five large pieces of broken pots or tiles across, so that they rest on the inside ledge left by the hammer, leaving interstices for the free emission of roots: on these place some of the most lumpy part of your compost; then your tree, not too deeply, but so that the upper part of its roots are a little below the rim of the pot: if it has a ball of earth, loosen it: fill up with compost; ram the earth down firmly, as you fill, with a stout blunt-pointed stick; place it on the border where it is to grow during the summer; give it two or three gallons of water, and a top-dressing of some manure to lie loosely on the surface, and the operation is finished.

We will suppose that our tree, a nice dwarf bush, with five, six, or seven branches, is potted. It may rest till February, and then be

* This is a term applied by nurserymen to trees one year old from the bud or graft.

pruned, — a pleasant, simple operation, more easy to show than to tell how to perform. I may as well now state that the pruning recommended here for apricots will serve for all bush fruit trees under orchard-house culture, except peaches, nectarines, and figs. Each branch must be shortened with a sharp knife to ten inches: these shortened branches will form the foundation of a nice regularly-shaped bush. In May each branch will put forth three or four shoots: all of these but the topmost one must be pinched off to within about two inches of their bases: they will form fruit-bearing spurs: these will continue all through the summer to make fresh shoots, which must always be pinched off to a length of two inches. By the end of the first season the leading shoots of the tree will be probably three feet in length, as well as the spurs, be furnished with blossom-buds. The summer is past; the month of October is with us. Its shoots are ripe, and the tree has ceased to grow: it must be put to rest for the winter, by lifting up the pot and cutting off closely every root that has made its way into the border: it is then ready for its top-dressing, the method of giving which I have described further on.

The second season: — in February, or early in March, the leading shoot made the preceding year, and which ought to be from two to three feet long, must be shortened to ten inches, and the young shoots as they push forth in summer (all but the leader) be pinched off as in the first season. The third season: — as the tree will have increased in size, its leading shoots may be shortened to six inches, and as it becomes aged and fruitful, annually to four inches, and at last pinched off in summer to two inches, so as to make a compact round bush. In the course of time some of the shoots in the centre of the tree will require thinning out with the knife, if at all crowded.

The general management of the trees the second year should be as follows:—

February is with us, and, if the season be mild, buds are beginning to swell, and flowers to bloom: the trees in your orchard-house are, however, dry, dusty, and stagnant; place them in their stations, three feet stem from stem, give each of them a small quantity, say a pint, of water, — not, however, if the winter is still raging, — let them rest three days, then give them a quart each — in short, gradually saturate the earth in the pots, and afterwards water them regularly according to the state of the weather. The buds, if the weather is mild, will soon begin to swell, and in March, or early in April, if the season be late, they will put forth their full bloom; and beautiful things they are, for no frost, no storms, will destroy the blossoms. If the weather be sunny, with sharp frosts at night, as is often the case in early spring, the shutters, both back and front, may be open all day and closed at night; if a wind-frost and cloudy weather, they may be closed day and night; the ventilation through the joints of the boards will then be amply sufficient. With this treatment nearly every blossom will set. As soon as the fruit becomes the size of a horse-bean, commence syringing the trees morning and evening with soft water, and continue to

do this all through the summer till the fruit begins to change color before ripening. Weak liquid manure may be given once a week during the summer. This is, however, almost a matter of choice. My trees grow and bear well without it. Guano water, one pound to twenty gallons, is perhaps as good as any; and a good soaking of this once a week is better than using it more frequently. While in their young state, the fruit must be thinned, leaving, at first, upon a bush that has been two years in a pot, about three dozen; which, when they attain the size of a small nutmeg, must be reduced to two dozen: the third year, a tree, if it has prospered, will be able to bring three dozen to maturity; it is, however, better to have a few finely-grown fruit than many that are small. If some of the trees are required to decorate the dessert — and what can be more ornamental than an apricot tree full of fruit? — they must be prepared for removal by lifting the pots a week previously, so as to break off the roots that have struck into the border: no harm will be done, — it only checks their growth a little prematurely; they must, however, in such cases, be brought back to the orchard-house after the fruit is gathered, and have water till the end of October.

To sustain trees in health, in pots, something more must be done than allowing their roots to go into the border; annually, in October, every tree should have a top-dressing of rich compost. I have employed, with much success, horse-droppings gathered from the roads and unctuous loam, equal parts. The former I have had saturated with night-soil or liquid manure, and then exposed to the air for two or three months before mixing it with the loam. Some powdered charcoal strewed over this compost will prevent any disagreeable smell. Any kind of rotten manure, however, and loam, seems to answer well for top-dressing, which is done in the following manner: take out a portion of the soil five or six inches in depth, and about four inches in width all round the side of the pot, leaving the central mass of roots undisturbed (a portian of the mould may, however, be picked out from among the mass of fibres with advantage, as fresh food can do them no harm); then fill in the compost, and ram it firmly down; keep on filling and ramming till it is on a level with the edge of the pot; place one or two inches of loose compost on the surface, as it will settle much during the winter; give one or two good soakings of water, and then place the trees close together, for you will then have more space for winter parsley, lettuces, young cauliflowers, and other matters requiring shelter. Water must be withheld, and the trees suffered to remain dry and completely at rest during the winter.

This treatment may be continued every year without variation, except as regards pruning. In removing the trees to their allotted places on the borders in spring, I have lately found it beneficial to take out about two shovelfuls of earth on the place where the pot is to stand, and replace it with the same quantity of the compost used for top-dressing, the tree is thus fed from above and below. It will be necessary in very dry winters to watch the trees to see if their roots shrivel;

if so, they must have a small quantity of water, but not in severe frost; and if the winter be excessively severe, to "make assurance doubly sure," some dry hay or litter may be laid on and around the pots: the dry state of the soil will, however, as far as my experience has gone, perfectly resist the effects of frost.

The best implement for top-dressing is a piece of iron rod an inch and a half in circumference and nine inches long, flattened at the end, with a handle of wood five inches long, like the annexed figure.

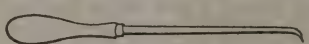


Fig. 5.

Now, let us see what we may expect from this treatment. The apricot, the peach, and nectarine, as is well known, all come from the East. We will take Persia or Armenia. The winter there is dry and very severe; the spring dry, with hot sun and piercing wind, just when peaches and apricots are in full bloom, and yet how they succeed! Let any one go into an orchard-house when we have our usual March weather: the wind will whistle through it, and the climate will be dry, sunny, and bracing; the blossoms, under these circumstances, will all set. Unfortunately, we cannot command sunshine enough to carry us along, to make our fruit ripen in May and June, as in warmer climates; we must, therefore, wait patiently, for our orchard-house climate is slow but sure in its operations. If the above directions are followed, Eastern Nature is imitated as closely as our cloudy skies permit. The trees bloom in a dry, airy place; they are, like all trees natives of dry climates, early in a state of perfect rest, which is continued all through the winter, and thus they form healthy shoots and well-developed blossom-buds. Nothing in culture can be more perfect, and all is so simple, that, knowing as I do, with what facility it is done, I feel ashamed of the many words I have used in describing it.

Peaches and Nectarines. — Few fruit trees give more satisfaction in the orchard-house than a choice selection of peaches and nectarines: when in blossom, in early spring, the trees are so fresh and beautiful; they are so exceedingly prolific; and in autumn, what fruit can vie in beauty with a ripe peach or nectarine? and what to the lover of fruit trees can be more gratifying than to see his sideboard or dining-table decorated with peach-bushes in pots, studded with their lovely and perfectly ripened fruit?

If bushes of only a moderate size are required, 11-inch pots, as recommended for apricots, may be used. It is surprising to see what vigorous growth, and what fine fruit, peach-trees in 11-inch pots will give; for, owing to the compost being rammed down, a large quantity of nutriment is given in a small space. I may as well, however, state, once for all, and for all descriptions of fruit, that, if fewer and larger trees are required, larger pots may be employed; thus 13, 15, or 18-inch pots may be used with equal success, by having numerous apertures at the bottom, allowing the emission of roots during the summer, root-pruning, and putting the tree to rest during the winter. A peach

FIG. 6.
An Elruge Nectarine Tree, three years old, from a Daguerreotype.

or nectarine tree may thus, in two or three years, be made capable of bearing many dozens of fruit; but I must confess that my taste inclines to small prolific trees only because one can have greater variety in a small space; and small trees are pretty, are easily looked over, so that each leaf and bud, each blossom and fruit is known."

The cultivation is much the same as that recommended for apricots. "Peaches and nectarines, either in the open air or under glass, are inclined to grow too vigorously: pot culture here gives a great advantage; the trees should be lifted, so as to break off all the roots that are entering the border from the apertures at the bottom of the pot; this operation should be performed once a week, commencing the second week in June, and continued till the end of July; they may then be

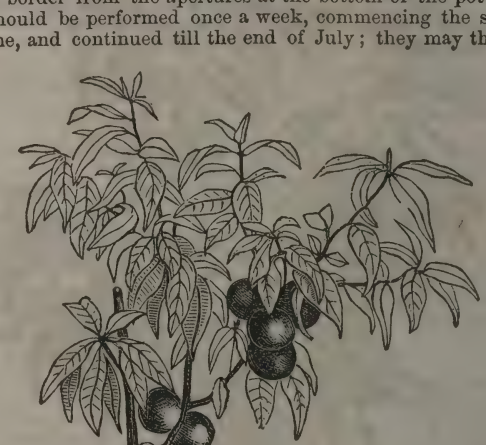


Fig. 7. — A Rivers Orange Nectarine, in an 8-inch pot.

suffered to make roots into the border until the fruit is gathered. By this treatment the trees become sturdy and short-jointed; i. e., very short spaces will be found between the buds. Trees that have been from five to seven years in pots will require abundance of water daily, in summer, as the pots become full of roots, and absorb a large quantity.

Ventilation. — There is a matter of importance in the cultivation of peaches and nectarines, to which I beg the reader's special attention, and that is free ventilation. In the warmer parts of England, and more particularly in Surrey, I have heard of two or three failures in growing peaches and nectarines in orchard-houses, owing entirely to the attacks of the red spider, brought on by the unskilful management of servants, calling themselves gardeners, who would persist in shutting up their houses at four o'clock in the afternoon, in hot weather,

and not opening them till nine in the morning; the poor trees were thus suffocated, and so enfeebled as not to be able to resist the attacks of this most persevering and insidious enemy. Now let me advise any one who has such a servant, to open all the shutters about the first week in July, and have them nailed so that they cannot be closed; they may remain so till the first of September. If the trees are regularly syringed, no red spider will make its appearance, and the fruit will be of much finer flavor for this constant and free ventilation. The usual and proper mode of ventilation is to have the shutters open by day all through the spring and early summer months, and open night and day as soon as the peaches begin to color, unless the house is in an exposed place, and the weather cold and windy, then they should be only partially open. But few gardeners have the courage to give air enough to orchard-houses and vineries: in mine, without fire-heat, abundance of air is given night and day, from the middle of July till the grapes are ripe."

Mr. Rivers gives a detailed account of his method of cultivating in pots, plums, cherries, figs, pears, grapes, apples, mulberries, strawberries, and almonds; but the intelligent gardener will be able to understand his system from the description already given. He also gives an interesting account of a "Hedge Orchard-House." He had some beech hedges, planted about thirty years ago for shelter. They had been closely clipped, and the sides "looked such compact green walls," that he was tempted to build some lean-to houses against them, "The climate," he says, "in these houses, in the summer months, is most delightful. Tea-scented roses, magnolias, and other shrubs, thrive admirably, owing to the dryness of the soil and air." As the winters in this country are more severe, they would not probably succeed so well here.

Teinning Fruit on Dwarf Pear Trees. — The operation of thinning the fruit on dwarf pear trees is too often neglected, especially by the inexperienced. When a dwarf tree is well established, it will set twice or three times as much fruit as ought to be suffered to mature. After the fruit has become fairly set in the spring, it should be thinned by cutting or pinching out the smaller and imperfect fruit, and leaving the rest equally distributed over the tree and upon the different branches. This is quite a delicate operation, and like pruning, to become perfect in it, requires much observation and experience. If too much fruit is left to grow, the specimens will be small and sometimes without flavor, and the tree will be stinted and exhausted. The quantity to be left must depend very much upon the age and vigor of the tree. A bushel and more of fine, large specimens have been grown upon a *Duchesse d'Angouleme* and upon a *Louise Bonne de Jersey* eight or ten years old, without injury to the tree: but this is a large crop. If trees of that age average a half bushel of perfect fruit, the cultivator ought to be satisfied.

ORNAMENT FOR DRIED FLOWERS.

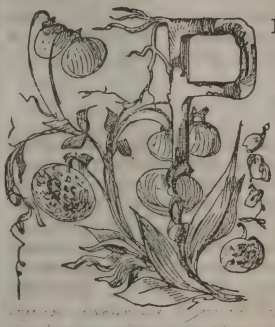
The above drawings, made for the *Horticulturist* by an accomplished lady, represent a pasteboard hanging vase, covered with moss, and attached to an oak branch, for a parlor ornament. From the materials employed, it is better suited for dried flowers than those which require water.

The smaller basket represents the mode in which the pasteboard is united after being shaped, and the latter exhibits the same covered with moss. Every lady of the least taste can make these baskets, and ornament her boudoir, parlor, or sitting-room, with her own handiwork, which she will enjoy more than expensive purchased objects.

The oak-leaves may be represented in winter in leather.

FRUITS OF THE OHIO VALLEY.

WRITTEN FOR THE RURAL ANNUAL, BY A. H. ERNST.



PERHAPS there is no territory of the same extent on the globe, more favorably situated than the *Valley of the Ohio* for the production of so many of the hardy fruits and those of the temperate zone — where they are more fully developed than here, with so little labor or skill employed. Embracing the district composed of Ohio, Kentucky, Indiana, part of Illinois, with East Tennessee, and the western slopes of Virginia and Pennsylvania — forming a great basin or ampitheater, sheltered on all sides, with little exception, from those devastating storms which often sweep over the western prairies and the Atlantic border of our country; with an undulating surface of hill and dale, abounding with springs and meandering rivulets, discharging themselves into the larger streams; the soil of great diversity, and among the most fertile in the world; a climate genial and rather mild. Here are found the Strawberry, Raspberry and Blackberry, the Whortleberry, Juneberry and Gooseberry, the Grape, Plum and Wild Apple — all flourishing in great perfection in a state of nature, giving hope and assurance to the enterprising fruit-grower, that his labors should not go unrewarded, which the event has more than realized. The better varieties of the Strawberry, Raspberry, Currant, Gooseberry, Grape, Plum, Peach, Apricot, Nectarine, Apple, Pear, Quince, &c., have been introduced from abroad, and flourish equally well, with some drawbacks, it is true, incident to the introduction of plants from a different soil and climate, which will be noticed in the proper place.

Fruits in general are very largely cultivated, both for domestic use and for exportation, but by no means as largely as they should be, or as the interest and profit of the farmer would justify. The demand more than keeps pace with the supply. The growth of large cities and communities of consumers in our midst are rapidly on the increase, demanding a corresponding increase of fruit plantations, which fact, it is feared, is overlooked by those most interested in their profits. The facilities also afforded by railroads for transporting the different fruits from point to point for hundreds of miles, including the most tender and delicate varieties, has opened to the fruit-grower such an extent of

market — the selection of so many points for the disposal of his crop — that if prices do not suit him in one, he can go to another. The effect of this is often to run up prices to an unreasonable rate, so that the more humble are obliged to go without these healthful luxuries. The consuming field, from these railroad facilities alone, has become so great that it is a sure and profitable opening to the fruit-grower, of almost unlimited extent, leaving the home market often poorly supplied, and as before observed, at very high prices. Add to this the vast quantities of the perishable sorts which are now annually put up in cans for winter use, and there need be no fears of an overstock, or very low prices, whatever quantity may be grown and brought to market.

THE APPLE.

The Apple, the great staple among fruits, was by the first settlers mostly propagated from seed, and relied on in this condition for fruit. Soon, however, grafts of some of the best sorts were brought from the east to Marietta, by Israel Putnam, and by him propagated and extensively disseminated. Many of these sorts still remain among our most popular varieties. The fruit of these seedling orchards, though mostly inferior, is notwithstanding the parent of some valuable varieties — among which may be named the *Belmont*, *Rome Beauty*, *Broadwell*, *McHenry*, *Morton*, *Delight*, *Fink*, and *Milan* — all excellent winter apples. Other fine sorts which are found in our orchards, and of the origin of which nothing is known, doubtless owe their parentage to the same source.

Among the early cultivators of fruits and propagators of trees, the name of Putnam will ever be remembered as occupying the lead. But none more deserve to be held in grateful remembrance by the public, than Silas Warton, a man of great energy and integrity of character, who came from New Jersey, bringing with him grafts of the most valuable sorts from the excellent collection of Cox. These he not only disseminated in the sale of trees, but supplied other nurserymen, and exchanged with them grafts for such valuable sorts as they had collected and brought from other directions. *Warton's Early* and *Warton's Seedling*, among our pears, will perpetuate a name deserving honor from all lovers of this fine fruit. Among those who entered heartily into the exchange of grafts and the improvement of the fruits of the country, the names of Andrew Hampton, of Richmond, Ind., John Osborn, of Economy, Ind., and Reuben Ragan, of Indianapolis, Ind., should not be passed by. Col. Allen, of Ky., was also among the most active and liberal disseminators of the best varieties of the Apple in the central part of this valley. Though humble and without pretensions, they were yet of inestimable worth to the country. There were other equally zealous co-workers in this pioneer work, but our limited space will not permit an extension of the list. More recently, as the country became settled, other fruits became objects of desire, and in the efforts to supply this demand many intelligent gentlemen fully partici-

pated, both in importing and disseminating approved sorts from abroad, and in producing new varieties from seed. Among these stands pre-eminent the name of Prof. J. P. KIRTLAND, of Cleveland, whose wonderful success in the production of new and superior varieties of the Cherry is unparalleled in the history of fruit culture.

Returning, however, to the Apple. As before observed, the reliance of the first settlers was chiefly on seeds brought with them from their distant homes, leaving the introduction of grafts to a more convenient time and season. Still there were those of the emigrants who were not indifferent to the luxury of good fruits in their new homes, and many of these carried with them trees or grafts of their favorite varieties. These, coming from the North, East, and South, soon concentrated a most valuable collection, so that all who would had no difficulty in obtaining an orchard of good varieties.

From the above statement of the rise of the Apple culture in this Valley, the intelligent reader will be at no loss to understand the cause of the great confusion in the nomenclature and identification which exists in this department of our fruit culture.

The Apple uniformly flourishes throughout this basin. It is only recently that symptoms of decay have appeared in some varieties, and that the tree and fruit have become the subjects of attack by insects and disease. These it will require some attention on the part of cultivators to counteract, a labor we have not been accustomed to. Large quantities are grown, which find a ready market for domestic use and for exportation. The early sorts are shipped to the North, and the winter sorts to the South. This trade could be very largely increased, and very profitably so. The high price at home, with this foreign market, should stimulate the extension of fruit plantations, as the consumption is always governed by the price: if that is high, the less will be used.

Among the varieties mostly cultivated, and which succeed best, are the following, viz:

Early Strawberry,
Prince's Yellow Harvest,
American Summer Pearmain,
Summer Rose,
Benoni,
Sweet Bough,
Red Astrachan,
Summer Queen,
Golden Sweet,
Fall Pippin,
Maiden Blush,
Lowell,
Porter,
Rambo,
Yellow Bellflower,
Golden Russet,
White Pippin,
Fallawater,
Jonathan,
Michael Henry Pippin,
Smith's Cider,
Newtown Spitzenburgh,
Winesap,
Wintersweet Paradise,
Yellow Newtown Pippin,
Green Newtown Pippin,
Broadwell,
Pryor's Red,
Rawle's Janet,
Rome Beauty,
Vandevere Pippin,
Westfield Seek-no-Further,
Swaar,
Milam.

There are of course many others in cultivation, too numerous to name, and some of which are very popular in certain districts and locations, but not fully tested or adapted to general cultivation. Some which formerly were very popular, are left off the list, because they give evidence of deterioration — such as the *Rhode Island Greening*, *Roxbury Russet*, *White Bellflower*, &c., which were among the most popular sorts in our collections; and still these should not be discarded, but efforts should be made to arrest the tendency to disease and decay. It is doubtless owing in part to the soil. Stiff limestone clay subsoil seems to be most unfavorable to these varieties; a light and more porous soil suits them best. We are generally *too far South* for the *Baldwin*, *Esopus Spitzenburgh*, *Hubbardston Nonsuch*, *Belmont*, and perhaps the *Northern Spy*, with other fine Northern varieties. Those above referred to become fall fruit with us, and are very liable to the bitter rot on the tree.

The Apple tree is not long lived. Thirty-five to forty years may be assumed as its longest period of useful existence. Fruit-growers and farmers should bear this in mind, and plant in time to keep up a succession of fruit-bearing trees, or they may be left without them when least desirable to be so.

THE PEAR.

This fruit bears abundantly, and in great perfection. Its introduction extensively is more recent than that of the Apple, though some of the older varieties have been cultivated from an early day in the settlement of the country — such as the *White Doyenne*, *Julienne*, &c.,— and still maintain their justly acquired reputation for superior character. Others, such as the *Summer Bonchretien*, have almost become worthless, — cracking, woody, and tasteless.

Within the last twenty years, quite a spirit of enthusiasm has grown up here, in common with other parts of our country, on the cultivation of this fruit. Many large and fine collections have been made, and others are still making. Vast quantities of trees have been imported from Eastern and European nurseries, and large numbers have been grown here, both on the quince as dwarfs, and on their own roots as standards, which will soon test what varieties are worthy of cultivation in our soil and climate. Many have already fruited. Of those sent among us as *very superior*, some have proved *worthless* here, as they are elsewhere; others have proved excellent and fine, fully deserving all that has been said in their favor. Among them may be recommended for extensive cultivation the following varieties, viz:

Doyenne d'Ete,	Tyson,
Rostiezer,	Beurre Benoist,
Dearborn's Seedling,	Buffum,
Madeleine,	Belle Lucrative,
Bloodgood,	Bartlett,
Jalousie de Fontenay,	Flemish Beauty,
St. Ghislain,	Beurre Goubault,

Fulton,	Fondante de Millet,
Soldat Laboreur,	Golden Beurre of Bilboa,
Beurre d'Anjou,	Beurre Diel,
Kirtland,	Beurre Bosc,
Stevens' Genesee,	Doyenne Sieulle,
Urbaniste,	Dix,
Julienne,	Nouveau Poiteau,
White Doyenne,	Beurre Clairgeau,
Duchesse d'Angouleme,	Lawrence,
Henriette, (Edwards')	Glout Morceau,
Wendell,	Winter Nelis,
Louise Bonne de Jersey,	Doyenne d'Alencon,
Seckel,	Easter Beurre.

Notwithstanding the large plantations which have been made, the market still is not supplied, much the larger proportion of trees being planted by amateurs for their own use. The few who have gone into the business for the market, and have been judicious in their selections, find it a very profitable business. There is no reason why it should not be made exceedingly so, especially if such sorts as the *Tyson*, *Bartlett*, *Flemish Beauty*, *Beurre d'Anjou*, *Beurre Clairgeau*, *Urbanist*, *Louise Bonne de Jersey*, *Seckel*, *White Doyenne*, *Julienne*, *Golden Beurre of Bilboa*, *Beurre Diel*, *Beurre Bosc*, and *Lawrence*, be cultivated. These are hardy trees, the fruit among the largest, handsome, and of the finest quality. They do well on the Quince, except the *Beurre Bosc* and *Julienne*.

The Pear tree grows remarkably well, both standard and dwarf, and is a uniform bearer when not cut off by late spring frosts. It is also long lived — much more so than the Apple tree. It has no enemy except the *fire-blight*, or what is known as such. This often proves destructive and fatal to large numbers of pear trees; otherwise it is as exempt ftom disease and death as any tree in cultivation. It is especially subject to attacks of this fire-blight during *wet and hot summers*, when the tree is stimulated to make an open and porous growth.— When this tender and delicate structure comes in contact with the sun's rays, and is fully exposed to its scorching action, there is produced what may be called *sun-stroke*, similar to that which destroys animal life; or if escaping this, and the wood is not fully matured, so that the sap vessels still remain filled with the fluids, and the tree is thus overtaken by severe cold, the effect is the same, though it may not show itself until the next summer, after the tree has put forth leaves and made growth. This is, as before observed, the only drawback to the cultivation of the Pear in our climate. Whether this can ever be overcome by any system of root or top pruning, or by any different mode of culture, remains to be tested. Certain it is, that the slow growing sorts — those which make firm and compact wood, such as the *Seckel* — are not subject to the fire-blight, but are as invulnerable as the oak.

Here as elsewhere in our country, great mistakes have been committed in the effort to cultivate the Pear on the Quince, both by attempt-

ing improper sorts, (such as will not grow on this stock,) and by improper treatment. This subject is coming to be better understood, and we may expect a corresponding success. The inducements to grow this fruit for market are very great, both for domestic use and exportation. Good varieties command almost any price, and our soil and climate seem admirably adapted to this fruit.

Ripening the Pear. — To have the Pear in the greatest perfection, it is of the utmost importance to understand the ripening process, and to observe this carefully. No Pear is so good ripened on the tree, as if ripened in the house; indeed, some are quite worthless if permitted to ripen on the tree, which otherwise are fine and superior. To describe fully the proper time to take the fruit from the tree is a difficult matter; it must be learned by observation and experience. Some require to be taken off sooner than others: for instance, the *Julienne*, if not taken from the tree when the fruit seems green, will be insipid and worthless; the *Seckel* would be harmed if taken from the tree long before its maturity. All Summer Pears should, as a general thing, be taken from the tree when fully grown, and while yet quite firm and hard, laid away on the floor of the fruit house, or placed in baskets of moderate size, and in a cool place, where they will not heat. The floor of the fruit house is, however, I think, the best, with a layer of hay under the fruit. Winter Pears should be put away in boxes, for if left exposed to the free action of the air they will shrivel and never ripen.

THE PEACH.

Formerly or rather in the early settlement of the country, this fruit grew almost spontaneously; it was only necessary to put the seeds in the ground, for the production of the finest sorts in two or three years, and in the greatest abundance. Hogs were fattened on them, until the appearance of the *peach moth* and *worm*, whose destructiveness of trees was so great that the culture was almost suspended. It seemed impossible to preserve trees from their destructive and voracious appetites, long enough to get a single crop of fruit. The cultivation has been resumed, however, with budded sorts — not that they are less liable to the attacks of the moth, or more hardy, but because cultivators have a better and surer reliance in the quality of the fruit. This resumption has been attended with great success and profit to those who have been careful to keep the grub from destroying the trees. Light, sandy loam and upland is found to be best for this fruit. It is less liable to late spring frosts and the attacks of the worm, and the fruit is more fully developed and finer flavored. Still it succeeds very well on our white oak ridges.

The price of this fruit rates high in the Cincinnati market and in our other large cities — from one to three dollars per basket — and always finds a ready sale. One individual in this neighborhood is reported to have realized, in profit, *twenty-five thousand dollars* from his crop in one season. This is perhaps an exaggeration, though it is doubtless a profitable busines to those who have a good location and pay proper attention to the trees and fruit.

The sorts mostly cultivated for market are the following:

Early York,	Brevoort's Morris,
George the Fourth,	Noblesse,
Grosse Mignonne,	Bergen's Yellow,
Crawford's Early,	Red Cheek Melocoton,
Oldmixon Free,	Late Red Rareripe,
Oldmixon Cling,	Yellow Rareripe,
Crawford's Late,	La Grange,
Cooledge's Favorite,	Heath Free,
Columbia,	Smock,
Early Newington,	Late Heath,
Early Red Froths,	Ward's Late.
Honest John,	

THE PLUM.

The tree of this fruit flourishes remarkably well in all soils and locations, blooms freely, and sets an abundance of fruit. The tree is perfectly healthy, liable to none of the diseases to which it is subject in the east and north of our country, and were it not for the *curculio*, we should have this luxury among fruits in great abundance and perfection. As it is, we are rarely permitted to indulge in this pleasure. All the best varieties have been introduced from abroad, and serve alike in supplying the curculio with the means of propagating its species.

Various means are resorted to, to prevent this insect from destroying the crop, the most successful of which is to plant the tree in pavements, near the house, where there is much passing, and where the worm cannot escape from the dropped fruit into the ground, to perfect itself. What is termed the "shaking system" is also practiced with favorable results. This is performed by first spreading a sheet under the tree, and then giving the tree a sudden jar by a blow from the hand or something that will not injure the bark of the tree. This brings the little Turk on the sheet, which is then gathered up and the insect is destroyed by throwing in the fire or otherwise. To be successful, this must be repeated two or three times a day, especially in the morning and evening, so long as any remain.

There is another process which is believed by some to be quite efficacious. It is a mixture of lime, flour of sulphur, and water, the liquid of which is thrown over the tree and fruit with a garden syringe. This is very offensive, and is thought to be particularly so to the supposed refined and sensitive organs of the curculio, which will not, it is said, come near the fruit so long as this mixture remains on it, and that if this application is repeated at proper intervals it will secure the fruit crop. The following are the proportions and the manner of preparing the composition: one-half bushel quick lime and six pounds flour of sulphur; put these in a barrel with one head out, and fill up with hot water; then cover over and let it stand for some hours, to become properly incorporated and settled. This preventive is so simple and easy of application, and one that all may use, that it is well worthy of

trial. Still the query presents itself, if the application of this liquid imparts to the fruit such an offensive taste that the curculio will not touch it, can the fruit be fit for our palates; or are their senses so much nicer, more refined and sensitive than ours?

Apricots and Nectarines share a common fate with the Plum. Any process which will protect the one from the ravages of the curculio will also save the others. The trees of these varieties grow finely, bloom freely, and set their fruit abundantly; but like the Plum, it is seldom that we are permitted to enjoy the luxury of the perfect fruits.

The Cincinnati Horticultural Society has a standing offer of a premium of one hundred dollars for a safe, practical, and cheap preventive of the ravages of the curculio — one susceptible of general application.

CHERRIES.

All the finer and best varieties have been introduced by our cultivators and amateurs. Their success, however, has not been very flattering. So long as the trees endure, the fruit perfects finely and is altogether satisfactory; but, with few exceptions, they are short lived. There is here and there a location in which the tree attains considerable age and size, and continues to produce large crops of fine fruit. Indeed, we meet with trees that are as large as a common forest tree, but these are mostly of the seedling Mazzard. The trees, as a general thing, seem not to possess sufficient constitution to endure the hot sun on our limestone lands. The Duke family do best, and succeed tolerably well. The Morellos, and that class, do quite well, and are perfectly hardy, producing uniform and large crops.

Attempts are making to cultivate the better sorts on the Mahaleb stock, as dwarfs. Time will show if they succeed better on this stock. Unless it be from the greater protection afforded to the body or stem of the tree, by the limbs and foliage, by this mode of training, it is not likely to prove very effective.

THE QUINCE.

This tree flourishes finely, and produces abundant crops of excellent fruit. The Apple-shaped is the variety mostly cultivated.

GOOSEBERRIES.

We are rather too far South for the full success of this fruit. Still many fine specimens are produced, and many varieties, such as the *Houghton Seedling*, do admirably, producing large and fine crops of perfect fruit. The chief difficulty is mildew on the fruit and plant of the European sorts. In dry, sandy or gravelly soils, they seem less affected with this disease, than in the limestone clay. American varieties undoubtedly succeed best, and from the exemption of the *Houghton Seedling* from mildew, we may be encouraged to attempt the production of larger and better varieties from seed — if not rivaling the finer European sorts, at least to give us a better supply and of better quality than we now have.

Floured sulphur, thrown over the plant during fruiting, will often prove salutary in protecting it against mildew. This should be put on with a garden syringe or a watering can, in solution with water.

RASPBERRIES.

The better sorts have generally been introduced from abroad, and succeed well, though the canes require protection from the severity, or rather changes of winter, by covering, or the fruit will be small and not well developed. This remark applies to all except the native varieties, and from this cause, the finer sorts are seldom found in our markets, being mostly cultivated by amateurs, for their own use. The *Franconia*, *Fastolff*, *True Red Antwerp*, and *Knevet's Giant*, of the red varieties, and *Brinckle's Orange*, of the yellow, succeed well in our soil and climate, are large and remarkably fine, and with proper winter protection never fail to bear large crops. This protection is a very simple process, and pays well for the labor employed. It is only to cut off the canes to a requisite height, as if pruning for fruiting, and taking out the old wood, then bending the canes down to the ground, lengthwise with the row, all one way, hook them down with forked branches cut from trees; then with the spade or the plow throw the earth from the alleys in a ridge over the canes. Let this remain on until spring, when it should be carefully raked off, and the canes brought to an upright position, to bloom and fruit. The covering should be done before hard freezing in the fall, or it will be of no avail.

The varieties chiefly cultivated for market are the native *Black Cap*, and a spurious *Red Antwerp*, probably also a native, or an accidental seedling. These are grown in large quantities, and find a ready sale at high prices. There is also a native ever-bearing variety, which so closely resembles the common *Black Cap* that it is difficult to distinguish it from the other, except by its continuous bearing properties. It is a strong grower, throwing up through the summer a continuation of new wood from the crown of the roots, on the ends of which it blooms and forms large clusters of fruit to the close of summer, but which is very likely to be appropriated as it ripens, by the birds, or to be dried up by the drouths of summer, before maturity. It is reproduced without difficulty from seed, or propagated by bending the ends of new shoots to the ground and covering them, when they readily take root. It does not sucker from the roots, as most other varieties of the Raspberry do.

BLACKBERRIES.

This berry here, as in most parts of our country, grows in immense quantities in nature's field, and is very largely brought in and sold for domestic use. It makes a large item in the fruit-dealer's business. They are also shipped to northern markets, especially when the price at home does not suit. They are found in great variety in size, quality and color, from a dark black to a copper, cream, and white. Black is, however, the prevailing variety, and the others are found only here

and there. Not much attention is yet paid to their cultivation; but the necessity for this is beginning to be felt, as the demand for the fruit is increasing, and the supply diminished by the clearing up of the country. The price will pay well for their culture and the ground occupied. Very large-fruited and superior sorts are often met with, that would compare favorably with the famed *Lawton*, or *New Rochelle*. Such should be selected for cultivation.

The statistics of the supplies of Blackberries and Strawberries to our market have excited some attention among our fruit-growers. Mr. BUCHANAN, who has the best opportunities of ascertaining the facts, finds that upwards of five thousand bushels have been received this year from boats, and by other conveyances he estimates an equal quantity. He finds the quantity of Strawberries sold in our market this year to have been from *seven* to *eight thousand bushels*, at the lowest estimate.

THE STRAWBERRY.

The Cincinnati market is not unknown to the world for its large and extensive supply of this luxury of the table, and the care our cultivators have taken in producing it in the greatest quantity and perfection, and also in originating new and improved varieties from seed — which would seem to make it unnecessary to say much on those points here. Still, a few remarks may not be uninteresting or out of place. Until about 1820 or 1825, little attention was paid to the cultivation of the Strawberry, the supply being mostly from the old *Virginia Scarlet*, which were hawked about the streets by the slaves of our Kentucky neighbors. About this time, Mrs. ARBEGART, a market gardener, came from Philadelphia and settled among us, bringing with her the old *Hudson*, which she cultivated with great success and profit to herself. Her success attracted the vigilant and sleepless eye of N. LONGWORTH, Esq., who soon procured plants of her, which he cultivated with great care, but without success in fruiting. They bloomed freely, but set no fruit. He was still obliged to look to the old lady for fruit for his family use. This was a mystery not easily understood. He had procured the plants from her, or at all events they came from her beds. He was perplexed, until one day a visit from the son of the old lady unwittingly disclosed the secret. While looking over Mr. L.'s Strawberry plantation, he remarked that he would have no fruit. Mr. L.'s shrewdness did not allow this remark to pass unnoticed, and he soon obtained from the untutored youth the fact that his plants were all *males* — that the old lady never allowed her *females* to go beyond her own borders, especially to such sinners as our friend. This important disclosure soon spread abroad, and led to the general knowledge, among our cultivators, of the sexual character of the strawberry, and stimulated by Mrs. A.'s great success, they failed not to act on its principles.

From this circumstance has grown the Strawberry culture, with its wonderful success, until Cincinnati has long since become famed as the greatest Strawberry region of the world, for quality, cheapness, and

quantity sold in its market. Immense fields of *twenty*, *thirty*, *forty*, and even *one hundred* acres, are not uncommon. These are mostly on new lands, and on the banks of the Licking River, which empties itself into the Ohio opposite the city, affording an easy means of conveyance to market. Hundreds of bushels are thus brought to market every day during the season, large quantities of which are shipped to the North — Cleveland, Buffalo, Chicago, &c. Owing to the opening of the latter markets to our cultivators, the price has been considerably enhanced, though the quantity grown is much enlarged each year.

The varieties mostly cultivated are the following, viz:—*Washington*, or *Iowa Male*, as a feltilizer and early fruiter; *New Pine*, for early fruiting; *Hovey's Seedling*, for main crop; *Hudson*, later, firm flesh, for shipping and preserving. Other sorts are being introduced and tested for field culture, such as *McAvoy's Superior*, *Longworth's Prolific*, *Extra Red*, &c., excellent amateur varieties, but not yet sufficiently increased for the former purpose. *Longworth's Prolific*, being an hermaphrodite, and producing abundant crops of large and fine fruit, is decidedly the best variety we have now under cultivation, for the amateur's use. *McAvoy's Superior* is an admirable fruit but is difficult of fertilization, which operates materially against its general introduction. The bloom is very large, and unless fully impregnated, produces only defective berries. From this cause it has often been condemned, though when its fertilization is cerefully provided for, there is no variety which produces larger and better crops, or attracts more attention in the border or on the table. It is questionable if either will answer the purpose of the market gardener so well as the more firm-fleshed varieties.

Very many other varieties are in cultivation among amateurs, which are fine for such purposes, but not for the market. Great efforts are making, by Mr. LONGWORTH and others, to improve our present varieties by hybridization. From these efforts we may look for some valuable results.

Our Kentucky neighbors are quite rude in their mode of cultivating the Strawberry. It is simply to clear the land of timber, harrow it over, put the plants in, in rows four feet apart and one foot in the rows, every tenth plant a staminate, and then let them take their chance. No other preparation is deemed necessary on these new lands. On older lands, of course, more care is necessary.

THE GRAPE.

The cultivation of this fruit, for the table and the manufacture of wine, has assumed an extent and a degree of importance placing it among the staples of our Valley, and is still being rapidly spread in every direction. The slopes of our hills, which are admirably adapted to its culture, are fast being appropriated to this use, and vineyards of various extent meet the eye at every turn. A brief sketch of the rise, progress, and prospective importance of this branch of horticulture, may not be uninteresting to the public or to the fruit culturists of this Valley.

Near the close of the last century, Mr. JOHN JAMES DUFOUR, a Swiss, with a small colony of his countrymen, having conceived the idea of the cultivation of the vine and the manufacture of wine on a large scale, formed a company at Lexington, Ky., for that purpose. This enterprise proved a failure, from various causes, among which was the employment of European varieties, unsuited to the climate, and the want of capital to continue their experiments. In the meantime, a branch of this colony, with additions from the Fatherland, located on the banks of the Ohio, in the new Territory of Indiana, at a point they called Vevay. Here, vigorous work was commenced with the *Cape*, and with much better success. Still, the want of experimental knowledge of our soil and climate, as differing from what they had been accustomed to in their own country, and the want of a Grape adapted to their purpose, again caused a final abandonment of the culture, but not until the introduction of the better and more suited *Catawba* had supplanted them in their efforts.

From the introduction of this latter variety may be dated the beginning of, or a solid basis for our vine culture. Its progress must of necessity be slow at first, from the want of plants; its extension, however, keeping full pace with their increase, until it is now estimated to have reached *three thousand acres*, and the wine produced at *one million gallons*, in a favorable season. This estimate embraces only a circuit of a few miles in the neighborhood of our city. The wine is mostly manufactured into *Still* and *Sparkling Catawba* — the latter supplanting *Champagne*, and all find a market at six to twelve dollars per box. The juice is usually sold from the press at one dollar per gallon, to those who prepare it for use.

As before observed, the slopes of our numerous hills, their soil and the climate, seem to invite an indefinite extension of the Grape culture. Here that peculiar odor for which our best wines are celebrated, called *bouquet*, and which depends for its development on the vinous fermentation, is more fully brought out and retained than in a more southern and warmer latitude. The temperature under which this process is carried on, is of the utmost importance in respect to the quality of the article, and this can always be best controlled and regulated in a moderate climate like ours. From these facts, it is apparent that here are combined all the essential elements for producing wine of the best character and in unlimited quantity, pure and unadulterated, if it be at all necessary for the use of man (?).

Larger experience in the modes of culture and training best adapted to our climate, and the production of new and better varieties from seed, will remove some of the causes of partial failures which now occur, such as mildew and the rot. The *Catawba* is the leading Grape; others are in the process of testing, but thus far nothing has appeared that equals it, either for the table or for wine. All the European sorts have been very extensively tried, and prove utterly worthless.

N. LONGWORTH, Esq., with his immense wealth, has done more to foster and stimulate the Grape culture, and the manufacture of wine, than any other individual in the country, though there is now much

other wealth and intelligence employed in promoting these objects. It is to be hoped that those who have embarked in this enterprise, with an *honest belief* that the use of wine will promote temperance, will not be disappointed.

The mode of culture is simple. The ground is trenched eighteen inches to two feet deep, and the vines planted in rows five feet apart and four feet in the rows. One-year-old plants are generally used; these are trained to stakes five or six feet high. The vines are cut back the first and second years, and not allowed to bear much until the third or fourth year.

FRUIT CULTURE IN THE WEST.

FAILURES AND DISCOURAGEMENTS, AND THEIR REMEDIES.

WRITTEN FOR THE RURAL ANNUAL, BY M. B. BATEHAM, COLUMBUS, OHIO.

The value of fruit as food, and as a means of promoting health when freely used in the family, especially in our *bilious* western climate, is beginning to be well understood by intelligent people. Hence we find an increasing demand for good fruits in all our towns and cities, and farmers are devoting more attention than formerly to their orchards and fruit gardens. No State in the Union, it is believed, possesses as a whole greater advantages of soil and climate for the production of good fruits than Ohio, and it may be safely asserted that in no State has there been a larger amount of money expended during the past ten years in the purchase of fruit trees.

Unfortunately, however, a large proportion of this expenditure has resulted only in failure and disappointment. The severity of the winters of late, and other causes, have been so disastrous to fruit trees and fruit crops, in most parts of this and adjoining States, that little progress has been made in this department of agriculture, and many cultivators have become in a measure disheartened.

The causes of these failures, and the best means of avoiding them in the future, have been the subjects of much discussion in the agricultural journals and the various horticultural and pomological societies; and although it is found that considerable difference of opinion exists on some theoretical points, the practical conclusions arrived at are generally the same.

The commencement of the series of disasters was the *severe drouth* of the summer of 1855. An unusually large number of fruit trees had been planted that season, most of which perished before the end of summer. Next followed the extraordinary severe winter of 1855–6,

which was the most disastrous to fruit trees of any winter that ever occurred in the West — killing nearly all the peach trees outright, and many of the apple, pear, cherry, grape, &c. At first it was supposed that no very general injury had been done to apple trees, as they did not show the extent of the mischief as soon as others. But before the end of summer many of the trees gave unmistakable evidence of disease, the cause of which could only be attributed to the past winter. Again the following year, and up to the present time, apple trees have continued to sicken and die, no doubt from the same cause, so that many persons have concluded that all the orchards that were of bearing age at the time of the hard winter, received such injury therefrom as will cause them prematurely to decay. The past winter, also, though mild in its general character, was very injurious to fruit trees, in consequence of the severe and sudden changes of temperature — causing the destruction of many peach and cherry trees, and doing much injury to the young wood of apple trees. This, it is believed, is the main cause of the falling of the young fruit, and the sickly color of the leaves in orchards throughout many parts of the West in the summer of 1858.

Such disasters, resulting from the vicissitudes of the seasons, are more or less liable to occur in all countries, and cannot be fully guarded against by human forethought, although much might be done to lessen the amount of injury in most cases of the kind, if people would profit by the lessons of the past.

Care should be taken to select the locations for orchards where the soil, elevation and exposure are such as are found to afford the greatest immunity from these injuries. The selection of varieties of fruit is also a matter of great importance; for it is found that some varieties are much hardier and better able to withstand severe changes of temperature than others. Attention to these two points will also in a great measure afford protection against several other evils, as the *scab*, *fungus*, *bitter-rot*, &c., of which more complaint than usual has been made by western fruit growers the past two or three years.

These evils, (scab, rot, &c.,) prevail most in the south-west, especially on strong limestone soils, and in valleys or level districts. Many experiments have been tried to remedy these by special manures and particular modes of pruning or culture, but with no valuable results. It is found, however, that these maladies affect mainly the varieties of apples which had their origin in northern States or countries; and there are enough others of good quality, natives of our own or more southern latitudes, which are nearly or quite exempt from these diseases. It is found that of all the leading varieties of winter apples, extensively planted here at an early day, as *Baldwin*, *Spitzenburgh*, *R. I. Greening*, *Roxbury Russet*, *Red Canada*, *Hubbardston's Nonsuch*, not one is a reliable or profitable fruit in most parts of central and southern Ohio; while on the other hand, all the most approved and reliable kinds for this region, such as *Wine Sap*, *White Pippin*, *Rawle's Janette*, *Rome Beauty*, *Smith's Cider*, *Yellow Bellflower*, &c., have not been as extensively introduced.

Many other Western varieties might be named, which are found of great excellence, and free from disease; it is therefore of the first importance that persons about to plant orchards should carefully inquire *what varieties are best adapted to their particular soil and locality.* It is unfortunate that at the present time there is no reliable work on fruits that can be recommended as affording to the people of the West the information they need on this subject, but it is hoped that this desideratum will be supplied during the coming year, through the labors of Dr. J. A. WARDER, of Cincinnati, who, it has been announced, is engaged on a work of this kind, and whose qualifications for the task give assurance that the performance will do credit to himself and to the West.

The Ohio Pomological Society, (organized in 1847,) composed of nurserymen and fruit growers, has done valuable service in bringing to notice the varieties of fruits found most valuable in different sections of this and adjoining States, also in correcting the erroneous names by which many of them were known in different parts of the country, and in diffusing information generally respecting fruits and fruit culture.

A NEW INSECT ENEMY. — A species of Canker Worm has made its appearance, and committed sad ravages on the apple trees in a number of counties in the central and western parts of Ohio, during the past few years. It was first noticed here about seven years ago, and has rapidly spread, so that the past year it was found in fifteen or twenty counties; it is also found in parts of Indiana, Illinois and Iowa. This worm is about an inch in length, of grayish variable color, smaller than the common orchard caterpillar, and differs from it in being smoother, and having but ten feet instead of sixteen, also in its mode of traveling, which is by looping up the body, then straightening itself, progressing its length at a time — hence it is commonly called the *span-worm*, or *measuring-worm.*

These worms make their appearance upon apple trees, (and sometimes the elm,) as early in spring as the young leaves afford them food. They do not live in a web or nest like the common caterpillar while young, (hence they cannot be readily seen or destroyed,) but distribute themselves singly and uniformly over the branches, and soon devour the young leaves and tender shoots, leaving the trees bare and rusty as though scorched with fire. After feeding for about four weeks, they let themselves down by a silken thread from the tree, and enter the ground, where they change to the chrysalis state, and finally appear as whitish moths, early the following spring, or during open weather in winter. The male moths have wings, *but the females none*, hence it is a mystery which is not yet explained, how these insects become so rapidly diffused over the country.

On sending some of these worms to Dr. ASA FITCH, of Albany, the Entomologist of the N. Y. State Ag. Society, he expressed the belief that they were identical with the *canker worm* of the Eastern States, or a closely allied species, but he could not determine fully without specimens of the perfect insect. It was the first intimation he had had of

any species of canker worm being found in the western country, and he thought there was reason to apprehend it would prove very troublesome to fruit growers; though as many kinds of insect tribes "come and go" often very suddenly and without visible cause, we may hope that this pest will some day take its departure as suddenly as it made its appearance. No easy or practicable method of preventing the ravages of these worms has been discovered, excepting such as are directed to preventing the female moths from ascending the tree to deposit their eggs, by means of bands of tar, or similar articles placed around the trunks, (on strips of cloth or strong paper,) but this requires much care and labor in order to be effectual, hence but few persons will practice it. Plenty of poultry kept in the orchard when the millers are coming from the ground, may lessen their numbers.

Other insects, as caterpillars, borers, apple worms, curculios, &c., are more or less prevalent and injurious to the fruit trees or fruit crops in Ohio, as in other States, but their ravages are not often very severe or extensive, except when they seem to be invited by the negligence of cultivators or a sickly condition of the trees arising from other causes.

The Peach Crop is at best an uncertain one in all parts of our country; but previous to the general destruction of trees by the winter of 1855–6, it was commonly regarded as a remunerative one in many parts of Ohio, and in some cases afforded very large profits. In the most favorable localities, as on sandy lands along the lake region, and on elevated ridges in the south-east quarter of the State, the trees have generally escaped injury by the winters, and fair crops of fruit are obtained almost every season, bringing large profits to the owners. If our winters are likely to prove frequently destructive to peach trees in most parts of the West, it would be well for enterprising men to engage largely in the cultivation of this fruit in localities where the crop is the surest, and where railroads or steamboats afford ready means of transportation to market. Much of the soil of the West is too clayey and rich for the healthy growth of the peach tree; hence cultivators should select for this fruit the most sandy and elevated portions of their grounds, and in ordinary cases give the trees no manure, only stirring the soil during summer to prevent the roots getting grass-bound, or suffering from drouth.

Cherries, of the larger varieties (*Heart* and *Bigarreau*,) do not succeed well in the South-West, where the soil is strong and clayey. In such localities the growth of the trees is too luxuriant and the wood too tender to endure the cold of winter or the heat of summer. But on the more sandy soils, as in the northern and eastern parts of Ohio, the cherry, like the peach, thrives and produces well. Occasionally we find good crops of cherries on pretty stiff soils, where somewhat porous and gravelly, and especially if the trees have been *trained low*, or other means adopted to shield the trunks from the sun and winds. The *bursting of the bark* of the trunk is the most common form of injury sustained by cherry trees; this is best prevented by securing a low dwarfish growth, or by fastening boards or bark around the trunks.

The *Duke* and *Morello* cherries, being naturally of slower and dwarfish growth, endure the climate much better, and may be grown successfully on most soils, although these also flourish best on sandy or gravelly lands. Some of the varieties of *Morello* cherries are highly productive and valuable for cooking, and there is no good reason why our markets should not be well supplied with them, excepting that cultivators have not given attention to the subject.

PEAR CULTURE is only just beginning to receive attention in Ohio, but enough has been done in the way of experiment to show that our climate and soil generally are well adapted to this fruit; and it is a fortunate circumstance that our strong clayey lands, which are unsuited for the peach and cherry, are the best adapted for the pear — and those who have a supply of good pears can afford to go without peaches and cherries. With a judicious selection of varieties, and proper skill in ripening the winter sorts, a supply of this luscious fruit may be had for the table nine months in the year; and by cultivating a good proportion of dwarf trees, one can begin to enjoy the fruits of his labor in a year or two after planting, instead of having to wait eight or ten years as formerly.

Much has yet to be learned, however, by the people of the West, in regard to the best varieties of pears for their soil and climate, as well as the best modes of culture. Some varieties formerly propagated and sold as dwarfs, have been found unsuited to this mode of growing, never forming a perfect union with the stock, and consequently being short-lived. This mistake, (which is now avoided by intelligent nurserymen) has been the occasion of some prejudice against dwarf pear trees, leading persons to conclude that all such trees are short-lived, which is not true. Another complaint made against dwarf pear trees is, that they require rich soil and extra culture. This is true, in the main, and no one should plant such trees who intends to let them "take their chance" among grass and weeds, as is too commonly done with other trees. But while it is admitted that they require good culture to make them productive or profitable, it is also claimed that they *pay well* for the care and labor bestowed upon them. It is not expected, however, that dwarf trees will "in the long run" be found the most profitable for market purposes. Further experiments are wanting to settle this and many other questions relating to pear culture.

GRAPES deserve more extended notice than the limits of this article will allow. Besides the extensive culture of this fruit in southern Ohio, for wine, there is reason for the belief that choice table grapes will in time be produced so abundantly in other parts of this State and the West as to become an extensive article of export, as well as a common article of diet. Already it is stated that 7,000 pounds of table grapes and 3,600 gallons of wine are annually exported from Kelly's Island (near Sandusky); and from the vicinity of Cleveland very large quantities of *Isabella* grapes have annually been exported for several years past. These and other experiments are suggestive of what may be expected in "the good time coming," when such varieties as the

Delaware and *Rebecca* grapes shall become generally diffused, and "knowledge shall be increased" so that people generally will understand all about the selection of soils, the best modes of culture, &c.

CURRANTS and GOOSEBERRIES are called *small fruits* in the catalogues, but those who have had most experience in their use as summer fruits for the family, will testify that they deserve a larger place than is usually assigned them in the farmer's garden. The currant is one of the most wholesome and refreshing fruits, and can be used in the greatest variety of ways. It is also the easiest grown, and the surest of all fruit crops, so that no one who has any ground need be without it. It is also a profitable fruit to raise for the market, and its use is increasing in our towns and cities. The gooseberry (the *Houghton* or American variety) equals the currant for ease of culture and abundant produce, and although less generally known, is much esteemed for cooking and preserving. It is also becoming a popular market fruit, and must be considered as among the best of the "fruits for the million."

CULTIVATION OF DWARF PEARS.

To cultivate dwarf pears successfully, the soil must be rich. It may be clay, or it may be a light or a strong loam; but if not already rich, it must be made so. There is no fruit tree that will bear so high cultivation as this. The ground should be well prepared before planting, by deep plowing or digging; and by deep and thorough draining, if at all wet. The roots of the quince do not extend far from the stock — in most cases not more than three or four feet — but they are exceedingly fibrous, and require a great deal of food to supply the stronger and more luxuriant growth of the pear. The trees may be planted eight feet apart. Care should be taken in planting, that the stock as well as the roots of the quince is covered with earth. The trees should be planted so that the point of union between the pear and the quince be at least even with the surface. The trees should be well manured every year. The best manure for this purpose is stable manure, well decomposed; and this should be applied and mixed well with the earth, late in the fall or early in the spring. A thick mulching of straw or other light material is almost as important as manure. It is an error to suppose that a crop of vegetables may be grown between the rows without injury to the trees. It is far better to give up the ground wholly to the pear trees; and then, if the earth is kept well stirred and free from weeds, by a liberal use of the hoe or the cultivator during the season of growth, a greater profit will be realized.

Among the varieties best adapted to the quince, are, for Summer Pears, the *Doyenne d' Ete*, *Beurre Giffard*, and *Brandywine;* for Autumn Pears, the *Louise Bonne de Jersey*, *Duchesse d' Angouleme*, *Beurre d' Anjou*, *Beurre Diel*, and *White Doyenne;* and for Winter Pears, the *Glout Morceau*, *Easter Beurre*, and *Lawrence*.

CULTIVATION OF BULBOUS FLOWER ROOTS.

Upon few, if any, classes of flowers, have amateurs bestowed more attention or expended more means, than those produced from bulbous flowering roots. Their cultivation has for the most part been confined to florists, and those amateurs and citizens whose wealth and taste have combined to turn their attention in that direction. They are seldom found with common cultivators. In the hope of introducing to more general cultivation some of the finer sorts of bulbs, it is proposed to furnish a brief description thereof, with the methods of cultivation best suited to their development.

Though possessed of much beauty individually, few of them are calculated to show well singly or at a distance, which has led to their being planted in groups, borders, and in large beds prepared so as best to display their modest beauty. It will not be necessary for the purpose in view, to give in detail the history and habits of each bulb, but only to mention those most desirable for general cultivation, with such practical directions for their management as will ensure, with proper treatment, ultimate success.

The Crocus.

The Crocus takes precedence as an early flower, its delicate blooms often appearing above ground while snow still remains on the border. Its size precludes its cultivation singly, and it is generally set in clumps, or along borders where, at a later period, other flowers are to bloom. In planting, the different colors are usually mixed,—the varieties most popular being the yellow, purple, striped and blue.

Plant in well prepared garden mould, mixed with about half sand, covering the bulb two inches deep, over which, late in the season, throw some coarse manure or decaying leaves for winter protection,—taking care to remove them on the first approach of spring, if too coarse for the flowers and leaves to penetrate. They retain their vigor bet-

ter if taken up every two or three years, when the offsets should be removed, and the bulbs changed to a different locality. They are grown in-doors, in pots and ornamental figures resembling some animal or a bee-hive, with numerous holes, through which the flowers and leaves protrude, giving the whole a very fine appearance. They should find a welcome in every cultivated yard and garden, as, passing away early in the season, the space is left for later blooming flowers.

The HYACINTH is deservedly a favorite with florists. It is a native of the Levant, being abundant about Aleppo and Bagdad. It was in cultivation as early as 1596. The largest share of attention has been bestowed upon this flower by the Dutch, who have originated nearly all the desirable varieties, and by whom it has been improved from a single to a double flowering bulb. From their gardens in the vicinity of Harlaem, it has been introduced into all parts of the civilized world, and undoubtedly takes rank as one of the finest and most desirable bulbous flowers. It is easy of cultivation, brilliant, beautiful and varied in color, and in fragrance does not suffer in comparison with the carnation or the rose.

The Hyacinth.

As before mentioned, they have double and single flowers, and also a variety of colors, of which red, white and blue, of different shades, are the most common. The supplies for American culture are obtained annually from Holland, and may be had during the fall of nurserymen and florists, and at many of the seed stores. They cannot be successfully or profitably propagated in this climate. Care should be exercised to secure good healthy sound bulbs, as the market is annually flooded with those of inferior sorts, that have bloomed before importation, and are of little value. These are known to the trade as "auction" bulbs, that being the usual method of sale. The soundest bulbs produce the most desirable flowers. The stem of a fine double Hyacinth should be strong, tall, and erect, supporting numerous

bells, which should be large and very double, with short footstalks in a horizontal position, giving the whole a compact, pyramidal form, with the crown or uppermost bell erect. Strong, bright colors are preferred, though many rose-colored, pure white and light blue Hyacinths are great favorites. The single Hyacinth has usually a larger and more perfectly formed bell than the double, and generally a more decided color.

For out-door culture, in this latitude, Hyacinths may be planted from the last of October until the frost prevents the proper working of the ground, though not later than the middle of November would be preferable. If planted too early, they sometimes get started and receive material injury, and occasionally are destroyed by the severe cold of winter. If not set until spring, they seldom bloom successfully the same season.

Hyacinths flourish best in a deep, rich soil, which, according to notions prevalent in Holland, should consist of "one-third river or sea sand, one-third fresh, sound earth, one-fourth well decomposed cow manure, at least two years old and free from litter, and one-twelfth of earth of decayed leaves or decayed peat." This or a similar compost, well pulverized, free from vermin, and well worked down, should be placed where it is to be used, some weeks before it is wanted.

In planting Hyacinths in a bed or border, it is the practice to place them in rows, about eight inches apart each way, and cover to the depth of four inches. The different colors, red, white and blue, under which all are classed, should be planted alternately, so as to diversify the appearance of the bed when in bloom. Before winter sets in, the bed should be covered a few inches deep with leaves, straw, or some such light substance; for though the Hyacinth is perfectly hardy, the blooms are rendered more perfect by such protection.

In four or six weeks after the season of blooming has passed, the foliage begins to turn yellow, and the bulbs may be taken up, the flower stems removed, and the bulbs placed on a well drained bed, leaves down, and covered with dry earth for two weeks to perfect the ripening; after which they may be trimmed of the leaves, roots, etc., brushed clean, wrapped in papers, or placed in dry sand or saw-dust, and put in a dry place until wanted for fall planting: or they may be left standing in the bed until the tops have dried, when they may be taken up, dried, and packed as before stated.

The Hyacinth is well adapted to in-door culture, and makes one of the finest parlor plants known. They may be potted in a compost similar to that used for beds, in moderate sized, *unglazed* earthen flower pots, placing the bulb an inch or more below the surface of the earth. Place the pots, for a few weeks, in a dark closet or dark, dry cellar, to develop the roots, after which they may be placed on a table in the back part of the room, contiguous to light, and out of danger from much frost. They will require sufficient watering, at regular intervals, to keep the earth moist. Sprinkling occasionally with a weak solution of guano, hastens their growth and bloom. Good strong bulbs, when

kept quite cool after the blooms appear, have remained in flower four to six weeks.

Hyacinths are also grown to a considerable extent in glass, and in this form are preferable as house plants, being free from dirt. Their general appearance, when thus grown, will be readily understood from the illustration on the opposite page, representing a double Hyacinth in full bloom, drawn from nature. The method of cultivation in this form may be thus briefly explained:

Fill the glass to near the top with rain water,; place the bulb on the glass so that the roots will just come in contact with the water, and set the glasses in a dark closet for a week or two, or until the roots are two or three inches long.. After this, place them in a room of moderate temperature, changing the water once in ten or twelve days, and you will be repaid with choice blossoms, and a rich, fragrant perfume. Keep them cool, but do not let them freeze. Heat destroys the bloom very soon. By the selection of different colors, and putting them in glass at intervals of a week or two, you may from two dozen bulbs have flowers from January to May.

Single Hyacinths, as a general thing, bloom more satisfactorily in glass than the double, and of both sorts there are selections for the purpose, usually indicated in the catalogues.

The TULIP holds the next rank as a desirable flowering bulb. It is said to have come originally from the Levant, and is common in Syria and abundant in Persia. They are divided into early and late, from their period of blooming. They have also other subdivisions, having reference to their distinctive characteristics as exhibited in flowering. The early tulips bloom in May, producing some very fine flowers, though from their superior color, and stronger habits of growth and flower, the late varieties have a decided preference.

As in speaking of the different classes into which tulips are divided, frequent use will be made of the term "*breeders*," it will be proper to furnish a brief explanation thereof. Breeders are such as have been grown from seed, and consist of one color, as red, purple, violet, gray, brown, black, yellow, or any individual color, without variation. By cultivating these in rather poor soil, the blooms become "broken," or variegated, producing new varieties in from one to twenty years. These varieties are kept distinct, and propagated by offsets, being classed as follows:

Prime Baguets: very tall, fine cups, with white bottoms, well broken with fine brown, and all from the same breeder.

Rigaut's Baguets: supposed a variety originating with a florist named RIGAUT, differing from the "prime" in not being as tall, but more highly colored and better broken.

Incomparable Verports: a particular kind of Bybloemens, with very perfect cups, cherry red and rose color, and white bottoms, well broken with shining brown.

Bybloemens, or nest flowers, with white grounds, or nearly so; beau-

tifully broken with shades of purple and a variety of colors, and from different breeders.

Bizarres, (from the French;) odd or irregular; yellow ground, broken with a variety of colors, and from different breeders.

Paroquets, or Parrot Tulips; edges of the petals are fringed, colors brilliant crimson and yellow with shades of bright green, but not highly esteemed among florists.

Double.—These are deemed sports or monsters, and are not appreciated by flower fanciers; they are of brilliant red, yellow, and mixed colors, and have an elegant appearance with their upright, tall, firm stalks, and crowns of peony-shaped flowers.

The Tulip is of comparatively easy cultivation, requiring a soil very similar to that for the Hyacinth, with (if any difference) less sand. They may be planted at about the same season, though not later than the 20th of October is preferable. If planted too late, the blooms will be imperfectly developed the succeeding season. They may be set about the same distance apart, though not quite as deep in the bed as the Hyacinth. When highly manured they make a ranker growth, but to the injury of the flower. After removing the winter protection of straw or leaves, it is necessary to keep them free from weeds. Those who desire flowers in the greatest perfection protect the beds from the hot sun, by a light awning prepared for the purpose, as too much heat destroys the beauty of the bed, by causing the colors to run together. The "Duc Van Tholl," single and double, succeed quite well in common garden soil, and the single is about the only one that succeeds well in pots, or for forcing.

The Narcissus.

These are the most esteemed early sorts. Tulips in beds will need taking up every three years. Separate the offsets; if they become too much crowded the flowers are injured, and if permitted to grow for several years, they will not flower at all. They should be taken up about the middle of June, dried, wrapped in paper, and kept in a dry place until wanted for planting. Those who would preserve distinct varieties by themselves cannot too carefully label them when taking up or planting.

The NARCISSUS is another hardy family of bulbous-rooted plants for spring flowering. They may be planted in any good garden soil, in October or

November, and may remain years unmolested, except occasional thinning, as the roots become closely matted in three or four years. Of the common Daffodil there are many very pretty species, with different flowers, very generally cultivated, though much degenerated for want of care.

Those which bear a number of flowers on the same stem, are called Polyanthus Narcissus, but cannot be as generally cultivated, not being perfectly hardy.

In the Narcissus family are included the Jonquils and the White or Poet's Narcissus, each worthy of a place in a collection.

Another very pretty and early spring flower is the Snow Drop. The bulbs are very small: should be planted in August, and taken up as often as every third year, in June or July, and replanted in August. To produce the most pleasing effect, they are planted in a clump of a dozen or more, in good soil, and about two inches deep. One variety has double flowers. Another flower, very similar to this, is known as the Great Snow Drop, with flowers twice as large as the others. Of this there are three kinds, flowering in spring, summer, and autumn. The bulbs are larger, and require planting five inches deep, and about the same distance from each other.

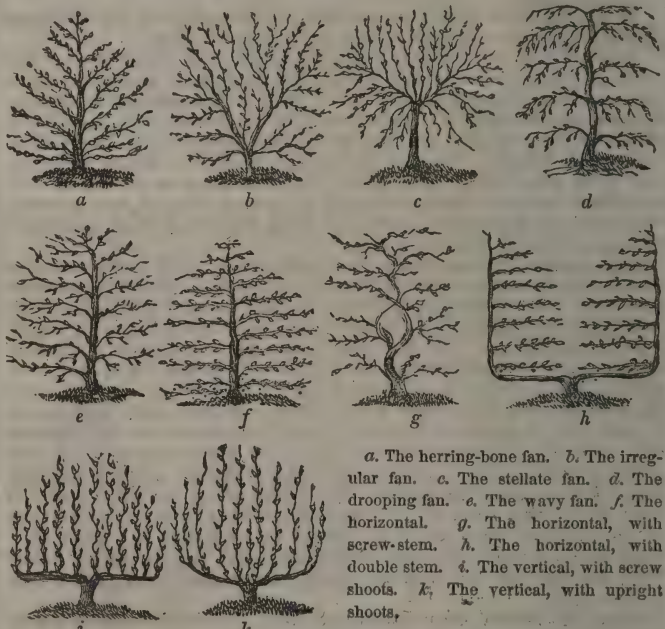
Still another bulbous flower, not esteemed as highly as its merit deserves, should not be overlooked in any collection. This is the Crown Imperial. There are many varieties, varying in color, as bright yellow, scarlet, orange, double red, double yellow, gold-striped leaved, silver-striped leaved, &c. The bulb and flower have an odor to many very disagreeable, detracting from its popularity, as bad odors will. Its season of flowering is April, when it throws up a strong, vigorous stem, three or four feet high, near the top of which are thrown out crowns of drooping, bell-shaped flowers; above this crown the stem terminates in a tuft of glossy green foliage, — the whole presenting a very striking and beautiful spectacle, appearing at so early a season that few other flowers grace the garden. The bulbs are large, fleshy, and not very solid, being made up of loose scales. They do not keep well out of ground, and when taken up should be replanted in a short time. They will not need replanting oftener than once in three or four years. They flourish best in a deep rich garden soil, planted not less than four inches deep.

There are several other bulbs and roots, cultivated more or less as florist's flowers, each deserving mention. Their treatment does not need to differ materially from those before described, and all of them will be found desirable in forming a good collection. Among these may be mentioned the Anemone, Amaryllis, Tiger Flower, Gladiolus, and Lily, as well as the Iris, Dahlia and Pæony,— many of which are common, well known flowers.

Black Pepper, dusted on cucumber and other vines, when the dew is on, is said to drive away the striped bug, without injury to the plants.

TRAINING WALL AND ESPALIER TREES.

McIntosh, in his *Book of the Garden*, gives the following figures, illustrating the leading modes of training wall and espalier trees, with the names by which they are designated:



a. The herring-bone fan. *b.* The irregular fan. *c.* The stellate fan. *d.* The drooping fan. *e.* The wavy fan. *f.* The horizontal. *g.* The horizontal, with screw-stem. *h.* The horizontal, with double stem. *i.* The vertical, with screw shoots. *k.* The vertical, with upright shoots.

Besides these, espaliers are trained horizontally, or in form of a table, the stem rising through the centre of the trellis, and the branches being trained in a radiating form. Sometimes the espalier is placed vertically, sometimes placed at one or other angle of elevation, either according to the latitude of the place, or the whim of the owner. All pruning and training must be considered subordinate to a proper selection of stock, and to operations on the roots. The true balancing of the power of the roots to that of the branches is most important.

In pruning, says McIntosh, the following practical rules should be

attended to. Commence on hardy trees soon after the gathering of the fruit and the fall of the leaves. Avoid frosty weather, or when it is approaching. In cutting, always draw the knife in an upward direction, and leave the wound smooth, to prevent the lodgment of water. In removing young wood, leave about an inch of the branch above the last bud; make the cut on the side opposite to it. But, in removing an old branch, cut it as close to the stem or branch left as possible, in order that the bark of the latter may cover the wood sooner. Use a sharp knife, a due share of consideration, and do not be in too great a hurry, lest you remove the branch which ought to have been left.

THE PLUM CURCULIO.

The curculio deposits its eggs in the plum shortly after the small cap formed by the blossom falls off, making a semi-circular or crescent-shaped mark on the side of the young fruit. In four or five days after the egg is laid, a small bluish line, near the skin, may be seen extending from the incision, which affords conclusive evidence that the egg is hatched. The larva, or grub, consumes the juices of the plum, and causes it to shrivel and fall from the tree. Almost immediately after the fruit has fallen, the grub leaves the plum and burrows into the ground, where it remains in the pupa form until the next spring, when it undergoes its last transformation, and comes out of the ground ready to ascend the tree and commence its work of destruction by the propagation of its species. The accompanying engravings will illustrate these transformations. Fig. 1 represents the larva, or worm, as found in the fruit when it falls; fig. 2,

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

the pupa, or form in which it lives in the ground; fig. 3, its appearance in the perfect or beetle state; fig. 4, its assumed form when shaken from the tree. The annexed cut shows the crescent-shaped mark on a stung plum, magnified to about twice its usual size. Our engraver has placed a curculio on the plum, which, we are free to confess, is not a very accurate likeness. His antennae are usually bent between the fore legs, and not lifted up, as in the engraving.

No certain remedy against the injurious attacks of the curculio has yet been discovered. The most efficacious is that known as "jarring the tree." As soon as the insects make their appearance, or when the plums are about the size of peas, spread white cotton sheets under the trees, and shake off the curculio. The plan usually recommended, is to strike the end of a limb that has been

sawed off, with a mallet or an axe, or to rap the branches with a long pole having a bumper at the end, such as an old India rubber overshoe, to prevent injury to the bark. The insects will drop from the tree, and should be summarily disposed of by pinching them gently with the thumb and finger. If the cotton sheeting is spread out and tacked to a light frame, six feet wide by twelve long, and doubling in the middle like the leaves of a book, it will be much more convenient. Two such frames, one on each side of the stem, will be large enough for a good sized tree. The sheets can be easily doubled together, and the curculios poured into a pail of hot water. This process must be repeated every morning, as long as any curculios are found on the trees. A sharp rap is requisite to jar them all off.

Another method, nearly if not quite as efficacious, and requiring much less labor, is to dig up the soil around the trees in the spring, and tread it smooth and hard, and *sweep up all the stung fruit as soon as it falls from the tree.* The efficaciousness of this process is corroborated by the well known fact that where hogs and poultry have free access to the plum trees, and eat the plums as soon as they drop, the curculio is not troublesome. It has also been observed, that where trees are surrounded with a close brick or stone pavement, and where, consequently, the larva cannot burrow into the ground, the fruit is not injuriously affected by the curculio. Mr. LONGWORTH, of Cincinnati, has twenty-seven trees so situated, and which have borne crops for the last twenty-five years, while trees in other parts of his grounds, where the soil is cultivated, have only borne two crops in the same period.

THE TRUFFLE.

OF all edible fungi, the Truffle, in the higher departments of cookery, is most prized. The common variety, (*Tuber cibarium,*) of which we annex an engraving, is found growing under ground in the southern part of England, and is obtained from the truffle-hunters, who train dogs to scent them out. It is of very irregular form, inclining to globular, without root or stem. It has never been grown artificially in England, with much success, although many attempts have been made, and a number of treatises written on the subject. Some of the continental gardeners, especially in Prussia, have been more successful. Its culture is somewhat similar to that of the mushroom. We do not know that it has ever been cultivated in this country.

The Truffle.

WEEPING OR DROOPING TREES.

Weeping or Drooping trees have within a few years past received more than ordinary attention. There is even, in some instances, a disposition to plant them too freely. Though elegant, graceful, and beautiful, they communicate, when too numerous, a mournful aspect to the landscape. On this account they are peculiarly appropriate for cemeteries. But we do not want to give our dwellings the appearance of mausoleums No grounds can be perfect without a few weeping trees, but they must be appropriately arranged, and not too numerous.

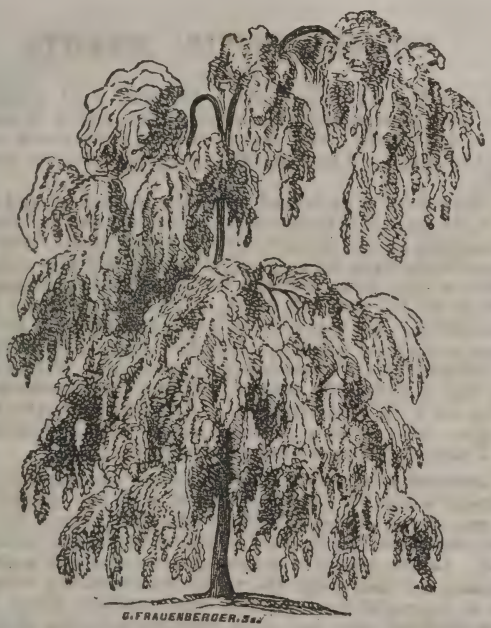
The European Weeping Ash — (*Fraxinus excelsior pendula*) — is one of the oldest and most widely disseminated trees of this character. Grafted on a common Ash, eight to twelve feet from the ground, it makes a tree of great beauty. This variety of the Ash was discovered in a field in Cambridgeshire, England, about the middle of the last century. From this grafts were taken, and the variety was rapidly disseminated over Europe and America. In the environs of London there are many very fine specimens of this tree, generally from fifteen to twenty-five feet high, with branches drooping to the ground, and covering a space of from twenty to thirty feet in diameter, or upwards. There is a specimen in the garden of a public house in Pentonville, of which the branches are trained on horizontal trellises, at the height of about seven feet from the ground, over twenty-eight seats and fourteen tables, covering a space of thirty-six feet long by twenty-one feet wide.

The Ash will grow in very barren soils, and in low, mucky situations, where, Woodward says, "the roots act as underdrains, and render the ground about them firm and hard." Lang, an excellent authority, however, states that "it is found in the highest perfection on dry loamy soils. On such it grows spontaneously. In moist, but not wet soils, it grows fast but soon sinks." It will grow freely on most soils, if the situation be tolerably good, except on retentive clays.

> "The Ash asks not a depth of fruitful mould,
> But, like frugality, on little means
> It thrives; and high o'er creviced ruins spreads
> Its ample shade, or on the naked rock,
> That nods in air, with graceful limbs depends."

The Weeping Sophora — (*Sophora Japonica pendula.*) This is a remarkable variety of the Japanese Sophora. It is a leguminous tree, and the foliage closely resembles the laburnum and locust. The shoots are quite pendulous. When grafted near the ground, the shoots run along the surface, like those of a trailing plant, to a very great extent from the main stem — extending, in good soil, six or eight feet in one season. Grafted on tall stocks of the Japan Sophora, it sends downward a head of long, slender, green shoots, and forms one of the most ornamental of pendulous trees. Our engraving is taken from a speci-

The European Weeping Ash.



The Weeping Sophora.

men growing in Knight's Exotic Nursery, Chelsea, England. It is none too hardy here at Rochester, but succeeds well when planted on good, *dry* soil, where its roots will ripen perfectly. It is one of the most beautiful of weeping trees, and should be extensively introduced wherever it succeeds.

Formerly our collection of weeping trees was rather meagre, but our nurserymen now propagate five or six varieties of Weeping Ash, and several of Willow, besides Weeping Oaks, Elms, Poplars, Beech, Birch, Mountain Ash, Larch, Linden, Laburnum, Sophora, Thorns, and many others.

GRAFTING wax for common use may be made of two pounds of rosin, one and one-fourth of a pound of beeswax, and three-fourths of a pound of tallow. For small nursery trees or root grafting, cloth well saturated with this composition is preferable to the wax itself.

USEFUL DOMESTIC RECEIPTS.

To Color Woolen Madder Red.—To every eight pounds of yarn or cloth take four pounds of madder, half a pound of alum, half a pound of creamtartar. Soak the madder in warm water over night. Dissolve the alum and creamtartar in soft water, boil five minutes and skim it.

Wet the articles to be colored in strong soap suds, and boil three hours in the alum and tartar water; wring out and air them. Now put the articles in the madder, have it warm over a slow fire, keep stirring with the hand for three hours, during that time wring and air them two or three times, and note the time required for airing, as they must be in the dye three full hours, or the color will fade; then wring out the articles. For the above quantity, dissolve well two quarts of soft soap in the dye; put them in for five minutes, then wring out and dry. After which wash thoroughly in soap suds. While airing and drying they should not be allowed to freeze. To save the madder after wringing out to air, shake the articles over a tub and return the chips to the dye. After coloring the above, if desired it will color old very well. I have always used a brass kettle for dying.

For Pickling Beef and Hams.—For every one hundred pounds of meat make a brine of eight pounds of salt, two pounds of brown sugar, two ounces salt petre, one and a half of pearlash, two ounces of allspice, one of red pepper, four gallons of water, boil, skim and let it get cold. Let the meat cool at least for one day and night, pack in tight casks, and then cover the meat, (which should have sufficient weight to prevent its floating,) with brine made as above. This will produce the finest corn beef after being in some ten days, and will never get too salt by remaining in the brine. This receipt will also be found very fine for hams, which should remain in pickle four to six weeks.

Butter.—In the summer, butter should not have wet cloths over it, as it will become frowy in a few days. Lay the butter in a wooden box, then put cabbage or horse radish leaves over it, then wring out two thicknesses of cloth in cold water, and lay it over the top of the box, but not have it touch the butter, and shut the cover on the cloth, then put into the wagon, out-shade the sun, and cover the box over with grass, and a farmer can carry his butter into market and have his balls in good shape, and it will be more profitable to the buyer. Ice should never touch butter.

Indian Pudding.—To one quart scalding milk add seven tablespoonfulls of Indian meal. Let it scald well; then add one teacup best molasses, teaspoonful of salt, ginger, cinnamon and allspice to the taste. Stir thoroughly, put in a deep dish, and bake five or six hours. Sauce, *good* butter. This is the old-fashioned New England pudding.

LIST OF FRUITS

RECOMMENDED BY THE AMERICAN POMOLOGICAL SOCIETY,

As Amended at its last Session, at New York, 1858.

FOR GENERAL CULTIVATION.

APPLES.

Am. Summer Pearmain,
Autumn Bough,
Baldwin,
Benoni,
Broadwell,
Bullock's Pippin,
Carolina June,
Coggswell,
Danvers Winter Sweet,
Early Harvest,
Early Strawberry,
Fallawater or Falwalder,
Fall Pippin,
Fameuse,
Gravenstein,
Hawley,
High Top Sweeting,
Hubbardston Nonsuch,
Jonathan,
Lady Apple,
Large Yellow Bough,
Melon,
Minister,
Monmouth Pippin,
Porter,
Primate,
Rambo,
Red Astrachan,
Rhode Island Greening,
Roxbury Russet,
Smith's Cider,
Summer Rose,
Swaar,
Vandervere,
Wagener,
Williams's Favorite (except for light soils),
Wine Apple, or Hays,
Winesap.

PEARS.

Ananas d'Ete,
Andrews,
Belle Lucrative, or Fondante d'Automne,
Beurre Bosc,
Beurre Clairgeau,
Beurre d'Anjou,
Beurre d'Aremberg,
Beurre Diel,
Beurre Giffard,
Beurre St. Nicholas,
Beurre Superfin,
Bloodgood,
Brandywine,
Buffum,
Cabot,
Dearborn's Seedling,
Doyenne Boussoch,
Doyenne d'Alencon,
Doyenne d'Ete,
Flemish Beauty,
Fulton,
Golden Beurre of Bilboa,
Howell,
Kingsessing,
Lawrence,
Louise Bonne de Jersey,
Madeleine,
Manning's Elizabeth,
Onondaga,
Osband's Summer,
Paradise d'Automne,
Rostiezer,
Seckel,
Sheldon,
St. Michael Archange,
Tyson,
Urbaniste,
Uvedale's St. Germain (for baking),
Vicar of Winkfield,
Williams's Bon Chretien, or Bartlett,
Winter Nelis.

PEARS FOR CULTIVATION ON QUINCE STOCKS.

Belle Epine Dumas,
Belle Lucrative,
Beurre d'Amalis,
Beurre d'Anjou,
Beurre Diel,
Beurre Langelier,
Beurre Superfin,
Buffum,
Catillac,
Doyenne d'Alencon,
Duchesse d'Angouleme,
Easter Beurre,
Figue d'Alencon,
Glout Morceau,
Long Green of Cox,
Louise Bonne de Jersey,
Napoleon,
Nouveau Poiteau,
Rostiezer,
Soldat Laboureur,
St. Michael Archange,
Urbaniste,
Uvedale's St. Germain, or Belle Angevine, (baking,)
Vicar of Winkfield,
White Doyenne.

PLUMS.

Bleecker's Gage,
Coe's Golden Drop,
Green Gage,
Jefferson,
Lawrence's Favorite,
Lombard,
Purple Favorite,
Prince's Yellow Gage,
Purple Gage,
Reine Claude de Bavay,
Smith's Orleans,
Washington,
McLaughlin.

CHERRIES.

Belle d'Orleans,	Coe's Transparent,	Elton,
Belle Magnifique,	Early Purple Guigne,	Graffion, or Bigarreau,
Black Eagle,	Governor Wood,	Knight's Early Black,
Black Tartarian,	Early Richmond, for cooking.	May Duke,
Downer's Late,		Reine Hortense.

APRICOTS.

Breda,	Large Early,	Moorpark.

NECTARINES.

Downton,	Early Violet,	Elruge.

PEACHES.

Bergen's Yellow,	Early York, *large*,	Large White Cling,
Coolidge's Favorite,	Early York, *serrated*,	Morris White,
Crawford's Early,	George IV,	Old Mixon Cling,
Crawford's Late,	Grosse Mignonne,	Old Mixon Free.

GRAPES—UNDER GLASS.

Black Frontignan,	Chasselas de Fontainebleau,	White Frontignan,
Black Hamburg,	Grizzly Frontignan,	White Muscat of Alexandria.
Black Prince,		

GRAPES—OPEN CULTURE.

Catawba,	Delaware,	Isabella.
Concord,	Diana,	

RASPBERRIES.

Brinckle's Orange,	French,	Red Antwerp,
Fastolff,	Knevett's Giant,	Yellow Antwerp.
Franconia,		

STRAWBERRIES.

Boston Pine,	Hovey's Seedling,	Longworth's Prolific,
Hooker,	Large Early Scarlet,	Wilson's Albany.

BLACKBERRIES.

New Rochelle,		Dorchester.

CURRANTS.

Black Naples,	Red Dutch,	White Dutch,
Cherry,	Versailles,	White Grape.
May's Victoria,		

GOOSEBERRIES.

Crown Bob,	Houghton's Seedling,	Red Champagne,
Early Sulphur,	Iron-Monger,	Warrington,
Green Gage,	Laurel,	Woodward's Whitesmith.
	Green Walnut,	

NEW VARIETIES WHICH PROMISE WELL.

APPLES.

Buckingham,	Mother,	Willis' Sweeting,
Genesee Chief,	Prior's Red,	Winter Sweet Paradise,
Jeffries,	Primate,	Winthrop Greening, or Lincoln Pippin.
King of Tompkins County,	Smoke House,	
Ladies' Sweet,	White Winter Pearmain,	

PEARS.

Adams,
Alpha,
Bergen,
Beurre d'Albret,
Beurre Gris d'Hiver Nouveau,
Beurre Kennes,
Beurre Langlier,
Beurre Nantais,
Beurre Sterckman,
Brande's St. Germain,
Chancellor,
Charles Van Hooghten,
Collins,
Comte de Flanders,
Conseillier de la Cour,
Comptesse d'Alost,
Delices d'Hardenpont de Belgique,
Delices d'Hardenpont d' Angers,
Dix,
Doyenne Goubault,
Duchesse de Berri d'Ete,
Duchesse d'Orleans,
Emile d'Heyst,
Epine Dumas,
Fondante de Comice,
Fondante de Charneuse,
Fondante de Malines,
Fondante de Noel,
Henkel,
Hosen Schenk,
Hull,
Jalousie de Fontenay Vendee,
Kirtland,
Limon,
Lodge (of Penn.),
Merriam,
Niles,
Nouveau Poiteau,
Ott,
Philadelphia,
Pinneo,
Pius IX,
Pratt,
Rouselette d'Esperen
Sterling,
Stevens's Genesee,
Striped Madeleine,
Theodore Van Mons,
Van Assene, or Van Assche,
Walker,
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Carpenter's White,
China Cling,
Gorgas,
Hill's Chili,
Madeleine de Courson,
Susquehanna,
Teton de Venus.

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Duane's Purple,
Fellenberg,
General Hand,
German Prune,
Ives's Washington Seedling,
Munroe,
Pond's Seedling,
Rivers's Favorite,
St. Martin's Quetche,
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American Amber,
Bigarreau Monstreuse de Mezel,
Black Hawk,
Great Bigarreau of Downing,
Hovey,
Kirtland's Mary,
Ohio Beauty,
Rockport Bigarreau,
Walsh's Seedling,

GRAPES.

Hartford Prolific,
Herbemont,
Logan,
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RASPBERRIES.

American Red,
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STRAWBERRIES.

Genesee,
Le Baron,
McAvoy's Superior,
Scarlet Magnate,
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FOR PARTICULAR LOCALITIES.

APPLES.

Canada Red,
Æsopus Spitzenburgh,
Newtown Pippin,
Northern Spy,
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PEARS.

Gray Doyenne,
White Doyenne.

PEACHES.

Heath Cling.

PLUMS.

Imperial Gage.

STRAWBERRIES.

Burr's New Pine,
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FOR NORTHERN LOCALITIES.

APPLES.

Ribstone Pippin.

FOR GARDENS.

APPLES.

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CHERRIES.

Napoleon Bigarreau.—For Special Cultivation.

COLORED FRUITS AND FLOWERS.

OVER 200 VARIETIES of Colored Fruits and Flowers, embracing nearly all the popular Flowers and Fruits raised and sold by Nurserymen.

These Plates are colored after Nature, and represent a fair medium size of the Fruits, and are considered a very nicely made article. They are bought and used by many of the best Nurserymen in the United States.

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D. M. DEWEY, Bookseller,

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HORTICULTURAL ESTABLISHMENT
OF
LOUIS LEROY,
OF THE GRAND JARDIN, ANGERS, FRANCE.

MR. **PAUL BOSSANGE,** Agent, begs to inform Nurserymen, Seedsmen, Florists and others, that he is now prepared to furnish Catalogues of the above well known establishment, giving the prices for the Spring of 1859, and the transportation expenses from the Nursery at Angers to New York, per steam or sailing vessel.

The Catalogue embraces every variety of FRUIT, FOREST, and ORNAMENTAL TREES, as well as FLOWERS, SHRUBS, &c. Also, the mode and time of year for placing them out. For further particulars, apply to or address

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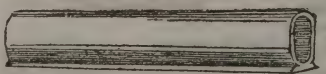

THE subscribers, being the most extensive manufacturers of Draining Tile in the United States, have on hand, in large or small quantities for Land Draining, the following descriptions, warranted superior to any made in this country, hard burned, and over one foot in length. On orders for 5,000 or more a discount will be made.

Horse-Shoe Tile—Pieces.			Sole Tile—Pieces.		
2½ inches rise,	$12 per 1000		2 inches rise,	$12 per 1000	
3½ " "	15	"	3 " "	18	"
4½ " "	18	"	4 " "	40	"
5½ " "	40	"	5 " "	60	"
6½ " "	60	"	6 " "	80	"
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Orders respectfully solicited. Cartage free.

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Albany, N. Y.

ROCHESTER COMMERCIAL NURSERIES.

H. E. HOOKER & CO.,

THE Proprietors of these old and well established Nurseries, would call the attention of Amateur Planters, Nurserymen, and Dealers in Trees, to their large and well assorted stock for the Spring and Autumn of 1859.

Especial care is taken not to send out anything which will not bear the test with absolute certainty, and purchasers may rely upon receiving perfect satisfaction.

Among the items cultivated upon the Nursery Grounds, in large quantities, will be found

APPLES, on free growing stocks, for Orchards, two to four years from graft.
do. on *Paradise* and *Doucain* stocks, for Dwarfs, making beautiful Trees for the Garden.
PEARS, on their own stocks, two to three years from the bud.
do. on Quince, A No. 1 trees, two years, very thrifty. Also, transplanted trees, with fruit buds.
CHERRIES, on *Mazzard* stocks for Standards and *Mahaleb* for Dwarfs, very fine.
PEACHES, one to two years from the bud.
PLUMS, on Plum stocks.
ORANGE QUINCE, a supply of very fine plants.
NECTARINES, APRICOTS, &c.
GRAPE VINES—Always on hand a large stock of all the Native and Foreign hardy varieties.

SMALL FRUITS,

Including a very extensive assortment of CURRANTS, STRAWBERRIES, GOOSEBERRIES, RASPBERRIES, BLACKBERRIES, &c.
RHUBARB, ASPARAGUS, &c.

IN THE ORNAMENTAL DEPARTMENT

Are intended to be found all the DECIDUOUS ORNAMENTAL TREES, of the most desirable kinds; EVERGREENS of the best varieties; HARDY ORNAMENTAL SHRUBS, ROSES, &c. HEDGE PLANTS of all kinds, including

THE AMERICAN ARBOR VITÆ,

Which forms in a short time, and with very great certainty, one of the MOST BEAUTIFUL SCREENS. A large supply of fine plants, low.

STOCKS FOR NURSERYMEN, as cheap as elsewhere, including very fine *Angers* and *Fontenay* Quince.

As a SPECIALITY, the subscribers would call particular attention to their stock of

THE HOOKER STRAWBERRY,

Which they are anxious to disseminate and introduce wherever the Strawberry is appreciated, convinced as they are of its intrinsic excellence.

At the last Annual Meeting of the GENESEE VALLEY HORTICULTURAL SOCIETY, this variety received *twelve votes*, (being the whole number cast,) as a variety best adapted for general cultivation, while no other kind had more than seven votes; and it has repeatedly received like flattering testimonials.

Its strong points, EXQUISITE FLAVOR, GREAT BEAUTY, SIZE, and PRODUCTIVENESS, combine to render it, what no other Strawberry can claim to be, one in every respect adapted to the wants of all cultivators.

The fruit is of a beautiful mahogany color even to the core, the plant very vigorous and hardy, and the flowers perfect, (a great desideratum.)

Strong, healthy plants, true to name, at $2 per hundred, $15 per thousand.

☞ Catalogues furnished gratis.

H. E. HOOKER & CO.

ROCHESTER, N. Y., Jan. 1, 1859.

FRUIT AND ORNAMENTAL TREES.

ELLWANGER & BARRY solicit the attention of Planters, Nurserymen and Dealers in Trees, to their present stock, which has never been equalled in extent, nor surpassed in vigor, health, and beauty of growth. In its propagation and culture, no pains have been spared to ensure accuracy.

Packing for distant parts is done in the most careful and skillful manner, and customers treated in all respects with fairness and liberality.

The leading articles of the stock may be enumerated as follows:

FRUIT DEPARTMENT.

APPLES on free stock for orchards, two to four years from bud and Graft.
Do. on Paradise and Doucian stock, for gardens, two to three years.
PEARS on Pear stock, two to three years from bud.
Do. on Quince stock, two years from bud.
Do. on Quince stock, three to four years, with fruit buds.
CHERRIES on Mazzard stocks, two years from bud.
Do. on Mahaleb stocks, two years from bud.
QUINCES, Orange, Portugal and Rea's Seedling, a superb new variety.
ENGLISH FILBERTS. SPANISH CHESTNUTS.
GRAPES, hardy, all the most valuable new and old sorts.
GRAPES, Foreign, for culture under glass; strong, well ripened plants, in pots, of all the best varieties.
BLACKBERRIES, New Rochelle, or Lawton, and Dorchester, (the largest stock in existence.)
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CURRANTS, White Grape, Cherry, Victoria, Black Naples, and many other old and new sorts.
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DECIDUOUS TREES—Elms, Maples, Cypress, Catalpas, Horse Chestnuts, Larch, Laburnums. Lindens, Magnolias, Mountain Ash, Tulip Trees, Salisburia, Poplars, Thorns, &c., &c., of all sizes.
WEEPING TREES—Ash, Birch, Elm, Linden, Mountain Ash, Poplar, Thorn, Willow, including the American and Kilmarnock.
EVERGREEN TREES—Arbor Vitæs, (American, Siberian and Chinese,) Red Cedar, Common Juniper, Balsam Fir, European Silver Fir, Norway Spruce, Red American Spruce, African or Silver Cedar, Japan Cedar (Cryptomeria,) Pines (Austrian Scotch, Benthomiana, &c.,) Yew (English and Irish,) Tree Box, Mahonia, Washington, or "Big Tree" of California, and many other California Evergreens.
FLOWERING SHRUBS, including all the finest new varieties of Althea, Calycanthus, Flowering Currant, Deutzia, Loniceras, Lilacs, Spiræa, Syringas, Viburnums, Weigelas, &c., &c.
CLIMBING SHRUBS, such as Honeysuckles, Bignonias, Aristolochia (Pipe Vine,) Clematis, Ivy. &c.
ROSES, Pæonias, Bulbous Roots, Dahlias, Phloxes, and other hardy border perennial plants.

Parties interested are invited to examine the stock. To those who buy largely, prices will be made entirely satisfactory, as the stock is very great and must be reduced.

The following Catalogues sent gratis, pre-paid, to all who enclose one stamp for each:

No. 1—Descriptive Catalogue of Fruits.
No. 2— do do of Ornamental Trees and Shrubs, &c.
No. 3— do do of Dahlias, Greenhouse Plants, &c.
No. 4—Wholesale Catalogue.

☞ Not wishing to be held responsible for the transactions of other parties, we hereby caution the public against certain persons who are in the habit of using our Catologues, and representing themselves as our agents, but who in reality have no dealings with us. The reputation of our establishment has already been injured in several parts of the country by such parties. All our agents, and those who purchase from us extensively to fill their orders, have certificates bearing our signature. Those who have no such certificates are to be regarded as impostors.

ELLWANGER & BARRY,
MOUNT HOPE NURSERIES, ROCHESTER, N. Y.

ROCHESTER CENTRAL NURSERIES.

THESE Nurseries, established six years ago, now embrace a very large stock of *FRUIT AND ORNAMENTAL TREES AND PLANTS*, of the choicest and most valuable varieties. Much labor and expense have been incurred in the

FRUIT DEPARTMENT,

In obtaining and propagating the various sorts, true and genuine, and the public can rely upon obtaining trees at this establishment which shall correspond to their labels.

Particular attention is paid to the REMOVAL AND PACKING OF TREES, so as to cause the least possible injury in transplanting.

PARTIES AT A DISTANCE, ordering anything of us by letter, will be honorably dealt with, as to quality of stock, and on the most liberal and satisfactory terms.

Constantly on hand and for sale,

STANDARD AND DWARF APPLE TREES;
" " PEAR "
" " CHERRY "

PLUMS, PEACHES, APRICOTS, NECTARINES, QUINCES, &c., &c.

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ISABELLA, CATAWBA, CLINTON, DELAWARE, REBECCA, DIANA, CONCORD, and all the thoroughly tested and approved new native sorts.
FOREIGN GRAPES, for Vineries.

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CURRANTS, GOOSEBERRIES. RASPBERRIES, STRAWBERRIES, BLACKBERRIES, &c.,—comprising all the new and valuable varieties.

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ORNAMENTAL TREES,

ROSES AND FLOWERING SHRUBS,

Climbing Plants, Greenhouse and Bedding-out Plants.

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THE PROPRIETOR HAS ON SALE, AT UNUSUALLY LOW PRICES,

FRUIT AND ORNAMENTAL TREES, SHRUBS, AND VINES,

Such as APPLES, DWARF PEARS, PLUMS, CHERRIES, PEACHES, QUINCES, GRAPES, APRICOTS, RASPBERRIES, CURRANTS, GOOSEBERRIES, EVERGREENS, BULBOUS ROOTS, DOUBLE DAHLIAS, ROSES, GREENHOUSE AND BEDDING-OUT PLANTS, PRIVET FOR HEDGES, BOQUETS AND CUT FLOWERS, &c.

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OF SUPERIOR QUALITY.

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WOULD respectfully invite the attention of those interested in the cultivation of Flowers, to his extensive and well selected assortment of the above, comprising every desirable variety in cultivation, of both Foreign and Home growth. His new Descriptive Catalogue for 1859 will be published in January, and will contain all the novelties of the season, with many rare and choice seeds, and a total of upwards of

EIGHT HUNDRED VARIETIES OF FLOWER SEEDS,

Of each of which a complete description is given, by means of a tabular arrangement, admirably adapted for referential convenience, with explicit directions for their culture. He would invite particular attention to his choice collection of

FRENCH AND GERMAN ASTERS,
CARNATION AND PICOTEE PINKS,
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DOUBLE HOLLYHOCKS,
DOUBLE BALSAMS,
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Received direct from the parties who grow the plants for the English and Continental Exhibitions, by which he is enabled to insure to purchasers pure and genuine seeds of the best sorts in cultivation, raised from prize flowers only.

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For the accommodation of those who love the cultivation of Flowers, but who reside at a distance from where they can be procured, he has selected from his large assortment of Flower Seeds, the most showy varieties, and those of easy culture, and put them up in assortments, which will be sent, postpaid, to any address in the Union, at the following prices:

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PARSONS & CO.,

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INVITE attention to their fine stock of HARDY and EXOTIC TREES and PLANTS, constantly enriched by their collectors in America, and by importations from abroad.

Their EXOTIC DEPARTMENT, occupying a number of houses, is full of rare and valuable Plants, and is worthy the inspection of visitors. The varieties of *Exotic Grapes* are kept genuine by constant propagation from fruit-bearing vines, to which two houses are devoted.

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In the OPEN GROUND DEPARTMENT, they offer a large stock of well-grown and thrifty *Fruit Trees*, suitable either for the Amateur or the Dealer, including the finest kinds of *Standard and Dwarf Pears, Cherries, Plums, Peaches, Apples, &c.* These are now offered at reduced prices.

In the HARDY ORNAMENTAL DEPARTMENT will be found a large quantity and variety of *Deciduous and Evergreen Trees and Shrubs*, for the Avenue, Lawn, or Garden. Of these some fine varieties are cultivated in very large quantities, and sold at a great reduction from the usual rates. Among them are *Spiræas, Lilacs, Forsythias, Weigelcas, Stuartias, Andromedas, Pyrus japonica, Norway Spruce, Deciduous Cypress, Larch, Ash, Maple, Beech, Linden*, and others.

They have made the RHODODENDRON a speciality, and have cultivated it in such large quantities that they can offer it at greatly reduced rates. The beauty and richness of the foliage and flowers of this valuable shrub cannot be too highly appreciated.

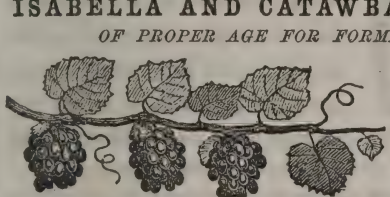
A new feature of their establishment is the extensive propagation of the RARE EVERGREENS, the cost of importing which has hitherto placed them beyond the reach of any but the wealthy. They can thus offer at moderate rates, the fine sorts, as *Podocarpus, Retinospernum, Cephalotaxus, Thujiopsis, Taxus erecta*, and others.

For HEDGES, they would call attention to the *Siberian Arbor Vitæ*, which is far more valuable than the *American*, in that it bears transplanting well, is very close and compact in its habit, requires no trimming, and is not affected by the coldest winter.

A general or trade catalogue will be sent on application. Careful attention is given to packing and forwarding.

ISABELLA AND CATAWBA GRAPE VINES,

OF PROPER AGE FOR FORMING VINEYARDS.



CULTIVATED from, and containing all the good qualities which the most improved cultivation for over seventeen years has conferred on the Croton Point Vineyards, are offered to the public. Those who may purchase will receive such instructions for four years, as will enable them to cultivate the Grape with entire success, providing their locality is not too far north.

All communications addressed to R. T. UNDERHILL, M. D., NEW YORK, or CROTON POINT, Westchester County, N. Y., will receive attention.

Having ripened his whole crop of Isabella and Catawba Grapes in 1857, the coolest season and most difficult to ripen in twenty years, he is confirmed in the belief that a good crop of fruit can be obtained every year by *improved cultivation, pruning, &c.*, in most of the Northern, and all of the Middle, Western and Southern States.

N. B. To those who take sufficient to plant six acres, as he directs, he will, when they commence bearing, furnish the owner with one of his Vine-dressers, whom he has instructed in his mode of cultivation, and he will do all the labor of the Vineyard, and insure the most perfect success. The only charge, a reasonable compensation for the labor.

Also APPLE-QUINCE TREES, (which are sometimes called the Orange Quince,) for sale as above.

R. T. UNDERHILL, M. D.

FRUIT TREES FOR THE SOUTH-WEST,

AT THE

COLUMBUS NURSERY.

A VERY LARGE ASSORTMENT of FRUIT and other TREES, SHRUBS, VINES, &c., including

APPLE TREES, Standard and Dwarf, and of the best varieties for Central and Southern Ohio, Indiana, Kentucky, &c.

PEAR TREES, both Standard and Dwarf, the latter on Angers Quince stocks, very thrifty and handsome.

CHERRY TREES, adapted to the climate of the South-West, mostly on *Mahaleb stocks*, and branching low.

PEACH TREES, of the best age and size, very stocky growth, and of the choicest kinds.

PLUMS, QUINCES, APRICOTS, NECTARINES, ALMONDS, GRAPES, CURRANTS, GOOSEBERRIES, RASPBERRIES, STRAWBERRIES, RHUBARB AND ASPARAGUS ROOTS, OSAGE ORANGE PLANTS, &c.

Also, EVERGREENS of various kinds, ROSES, and ORNAMENTAL SHRUBS and FLOWERS, in great variety, and at low prices.

☞ Send for a DESCRIPTIVE CATALOGUE, and order directly from head-quarters, as *no Agents are employed to sell trees for us.* Articles will be packed securely, and forwarded as directed. Address

M. B. BATEHAM & CO.,
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INDESTRUCTIBLE LABEL

FOR

FRUIT TREES, FLOWERING SHRUBS, ROSES, &C.

The subscriber would invite the attention of Amateurs, Fruit Growers and Nurserymen to this useful article, which has received the approval of many of the leading Horticulturists in the country. Their cheapness, durability and neatness of design, render them essential in every well conducted Garden, Orchard or Conservatory, in any climate, not being in any way effected by heat or dampness.

A NEW LABEL.—B. K. BLISS, of Springfield, Mass., well known to our readers as an extensive grower of Flower Seeds and Plants, during a call at our office last week, showed us a label for trees, plants, and any other similar use, which apparently combines every requisite for such an article. The above cut, with a word or two of explanation, will render this useful invention (on which a patent has been applied for) perfectly clear to the reader. The edges of a circular zinc back are turned over the edge of a mica front, between which the label, printed on paper, is placed, and shows through the mica in front of it as clearly as through glass. By the aid of a little cement, the whole is rendered impervious to water, and forms an indestructible, neat, and always legible label, at a very small cost. All who see them will unite with us at once, we think, in commending the article to universal use.—*Country Gentleman.*

A sample Label, with a list of the varieties now ready for sale, will be sent to any address in the Union on receipt of two three-cent stamps.

PRICE 60 CTS. PER DOZ., $4 PER HUNDRED. Address

B. K. BLISS,
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STRAWBERRY PLANTS.

J. H. BOARDMAN

OFFERS strong, well rooted plants, of the best new and old, American and Foreign varieties, at LOW rates.

All orders, from one dozen to ten thousand Plants, will be promptly filled after April 1st for Spring planting, and after August 15th for Summer planting, and packed to go safely by Express to any part of the country.

Priced Lists on application. Address

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THE LAWTON

BLACKBERRY

IS UNIQUE,

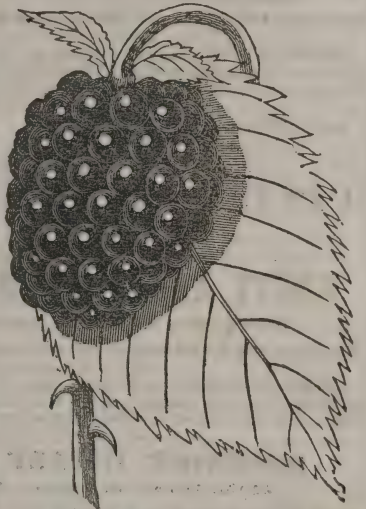
And not, as some have been led to believe, the common "New Rochelle Blackberry," *improved by cultivation.* It differs in SHAPE, SIZE, and QUALITY, from all others. Is

PERFECTLY HARDY,

enduring the severest winters without protection. The FRUIT is delicious, having SMALL SEEDS in proportion to its size; is a prodigious bearer, and in any *good farming soil*, the STALK, LEAF, FLOWER and FRUIT, will grow of mammoth proportions.

The original variety for sale by

WM. LAWTON,
NEW ROCHELLE, N. Y.



Fac simile from Nature.

WILSON'S ALBANY STRAWBERRY.

Will Yield from 150 to 200 Bushels per Acre.

THE subscriber is prepared to supply all who may favor him with their orders, with plants of this renowned variety. As the original stock is still in his possession, he flatters himself to possess unequalled facilities for supplying all orders, both with regard to genuineness and quality of plants. With regard to its productiveness there is no doubt, since a SINGLE PLANT, the past season, produced the enormous quantity of THREE HUNDRED AND SEVENTY BERRIES!

Price:—Per 100, $2.00; Per 500, $7.00; Per 1000, $10.00.

Also, a good assortment of FRUIT AND ORNAMENTAL TREES, GRAPES, CURRANTS, RASPBERRIES, BLACKBERRIES, GOOSEBERRIES, &c., &c., and a collection of GREENHOUSE and BEDDING PLANTS, HARDY SHRUBS, ROSES, BULBS, and HERBACEOUS PLANTS, which compare favorably with any others in the State.

Terms as low as any other establishment.

JOHN WILSON,
ALBANY NURSERY, ALBANY, N. Y.

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PROPRIETOR OF THE

GREAT WESTERN NURSERY,

TOLEDO, OHIO,

CULTIVATES LARGELY,

FRUIT AND ORNAMENTAL TREES,

Evergreens, Stocks and Seedlings for Nurserymen,

Greenhouse and Bedding-out Plants. Also, a general assortment of Nursery articles.

☞ Our Nursery is situated on the South Bank of the Maumee River, two miles above the Ferry Landing, (enquire on the Ferry Boat.) Articles delivered at the City Depot, or at any place of the same distance, free of charge.

H. A. ENSIGN. H. G. FORD.

ENSIGN & FORD,

PROPRIETORS OF

THE OHIO NURSERY,

TOLEDO, OHIO,

CULTIVATE LARGELY

FRUIT AND ORNAMENTAL TREES,

Evergreens, Stocks and Seedlings for Nurserymen,

Greenhouse and Bedding-out Plants, and a general assortment of Nursery articles.

Our Nursery is situatad on the South Bank of the Maumee River, two miles above the Ferry Landing, (enquire on the Ferry Boat.) Articles delivered at the City Depot, or at any place of the same distance, free of charge.

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